INTRODUCING INFECTION PREVENTIONISTS TO ANTIMICROBIAL STEWARDSHIP IN LONG TERM CARE SETTINGS

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Disclosures

None
OBJECTIVES

- Understand the role infection preventionists can play in establishing antimicrobial stewardship program in long-term care facilities.

- Recognize the steps that are required for implementing antimicrobial stewardship program in long-term care facilities.

- Review the available resources that infection preventionists in long-term care facilities can use to develop antimicrobial stewardship program.
Why?
Post-acute care (Medicare) admissions are increasing in nursing homes

- Growing medical complexity
- Increasing exposure to devices, wounds and antibiotics
- High prevalence of multidrug-resistant organisms
Increasing Level of Complexity

Average ADL Dependence

2009 2010 2011 2012 2013

4.02 4.06 4.08 4.1 4.14

National Case Mix Index

2006 2007 2008 2009 2010 2011

1.27 1.29 1.30 1.31 1.31 1.35

AHCA Quality Report 2013
Reservoirs of MDROs

Crnich et al. Infect Control Hospital Epidemiol 2012; 33(11):1172-4
Role in Regional Dissemination of MDROs

- Outbreak of KPC-producing Enterobacteriaceae studied over a period of one year
- 42 cases were identified
- 24 cases were linked to 1 LTACH
- 75% of rest of the cases were linked to 3 NH
- Successful control requires extensive coordination between acute and long term care facilities

C. difficile Infections on the rise

- 25% to 75% of residents receive at least one course of antibiotics.

- 8% to 33% of those treated with an antibiotic in a LTCF acquire CDI.

- Prevalence has been reported to be as high as 14.7%.

- Incidence has ranged from 0.2 to 2.6/1000 resident days in some older studies.

- C. difficile estimated to have caused 112,800 infections with onset in nursing homes in 2012 representing quarter of all cases in the US.

How big is the antibiotic problem in LTCF?
Inappropriate Antibiotic Use in Nursing Homes

25 – 80% of use deemed inappropriate:

Diagnosis Related to Antibiotic Prescriptions

<table>
<thead>
<tr>
<th>Characteristic</th>
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</thead>
<tbody>
<tr>
<td>Antibiotics prescribed, n</td>
<td>9,373 courses</td>
</tr>
<tr>
<td>Incidence of antibiotic prescriptions, mean per 1,000 patient-days</td>
<td>7.3 courses</td>
</tr>
<tr>
<td>Residents exposed to at least 1 course antibiotics, %</td>
<td>66</td>
</tr>
<tr>
<td>Mean duration of antibiotics, d (range)</td>
<td>9 (1 to 365)</td>
</tr>
<tr>
<td>Indications, %</td>
<td></td>
</tr>
<tr>
<td>Lower respiratory tract infection</td>
<td>36</td>
</tr>
<tr>
<td>Urinary infection</td>
<td>33</td>
</tr>
<tr>
<td>Skin and soft tissue infection</td>
<td>13</td>
</tr>
<tr>
<td>Miscellaneous other infections</td>
<td>9</td>
</tr>
<tr>
<td>Prophylaxis</td>
<td>5</td>
</tr>
<tr>
<td>Fever with no known focus</td>
<td>2</td>
</tr>
</tbody>
</table>

Inappropriately Treating Asymptomatic Bacteriuria

Up to one-third of prescriptions for suspected urinary tract infection in NH residents are for asymptomatic bacteriuria.

Box 1: Summary of issues and themes identified in the focus group discussions

- Nurses' and physicians' interpretation of bacteriuria as "symptomatic" in the presence of nonspecific symptoms
- The ordering of urine cultures for nonspecific changes in a resident’s status
- The central role of the nurse in communicating nonspecific changes in the health status of a resident to physicians and family members
- The difficulty in eliciting information about symptoms from frail elderly residents
- Uncertainty of physicians about the significance and management of a positive urine culture result
- Concern over liability of nurses and physicians

Walker S et al. CMAJ. 2000 Aug 8;163(3):273-7
Antibiotic Regimens can be partially or completely unnecessary

Long Duration Treatment Influenced by Provider Preference More Than Patient Characteristics

Figure 2. Funnel plot to determine whether variability in average treatment durations by individual prescribers is greater than can be expected by random chance. The CIs for the funnel plot are generated using exact binomial CIs for the expected proportion of treatments exceeding 7 days (standardized to the population average). Each dot indicates 1 of the 699 prescribers responsible for more than 20 individual antibiotic treatments. There were more long-duration outlier prescribers above 3-SD CIs (black dots) and short-duration outlier prescribers below 3-SD CIs (gray dots) than expected by random chance.

How to deal with this problem?
New CMS Regulation

Facility must establish an Infection Prevention and Control Program (IPCP) that includes:

- System for preventing, identifying, reporting, investigating and controlling infections
- Written standards, policies and procedures
- Antibiotic stewardship program
- System for recording incidents identified under IPCP and corrective actions taken

## Nursing Home Infection Control Program Elements

<table>
<thead>
<tr>
<th>Elements</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance</td>
<td>Using surveillance infection definitions:</td>
</tr>
<tr>
<td></td>
<td>• Loeb minimum criteria</td>
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<tr>
<td></td>
<td>• CDC/NHSN criteria</td>
</tr>
<tr>
<td></td>
<td>Calculating infection rates</td>
</tr>
<tr>
<td>Outbreak management</td>
<td>Disease specific (influenza, tuberculosis, viral gastroenteritis, scabies)</td>
</tr>
<tr>
<td>Implementation of routine</td>
<td>Hand hygiene</td>
</tr>
<tr>
<td>infection control policies and</td>
<td>Isolation precautions</td>
</tr>
<tr>
<td>procedures</td>
<td>MDROs</td>
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<tr>
<td></td>
<td>Device care</td>
</tr>
<tr>
<td>Communication with management</td>
<td>Sharing information and obtaining support for changes in policies and procedures</td>
</tr>
<tr>
<td>Disease reporting</td>
<td>Information transfer during care transitions</td>
</tr>
<tr>
<td></td>
<td>Reporting to public health authorities</td>
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<tr>
<td>Antibiotic stewardship</td>
<td>Review of antimicrobial usage</td>
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<tr>
<td>Resident health programs</td>
<td>Immunizations</td>
</tr>
<tr>
<td></td>
<td>Tuberculin testing</td>
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<tr>
<td></td>
<td>Hand hygiene</td>
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<tr>
<td></td>
<td>Oral care</td>
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<tr>
<td>Employee health programs</td>
<td>Immunizations</td>
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<tr>
<td></td>
<td>Occupational exposure to infectious organisms</td>
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<tr>
<td>Facility management</td>
<td>Food preparation</td>
</tr>
<tr>
<td></td>
<td>Laundry services</td>
</tr>
<tr>
<td></td>
<td>Infectious waste collection and disposal</td>
</tr>
<tr>
<td></td>
<td>Housekeeping (cleaning, disinfection)</td>
</tr>
</tbody>
</table>

**Abbreviations:** CDC/NHSN, Centers for Disease Control/National Healthcare Safety Network; MDROs, multidrug-resistant organisms.
General Role of IP in Antimicrobial Stewardship

Table 1
Examples of HE/IP strategies to improve stewardship

- Identification of MDROs detected among the population served by a health care facility
- As part of surveillance, the monitoring and reporting of trends over time involving MDROs
- Oversight of the use of standard and transmission-based precautions aimed at preventing cross transmission of pathogens
- Compliance with hand hygiene
- Use of surveillance data to inform risk assessment and planning for prevention of infection
- Education of clinicians on prudent and appropriate use of antibiotics
- Development of clinical algorithms for treating infections
- Audit, analysis and reporting of data on HAIs
- Implementation of strategies aimed at prevention of infection and elements involving prescribing and therapeutic use of antimicrobials, (eg, guidelines, decision support involving order/entry, de-escalation)

Establishing ASP in Nursing Home

Summary of Core Elements for Antibiotic Stewardship in Nursing Homes

- **Leadership commitment**
  - Demonstrate support and commitment to safe and appropriate antibiotic use in your facility

- **Accountability**
  - Identify physician, nursing and pharmacy leads responsible for promoting and overseeing antibiotic stewardship activities in your facility

- **Drug expertise**
  - Establish access to consultant pharmacists or other individuals with experience or training in antibiotic stewardship for your facility

- **Action**
  - Implement at least one policy or practice to improve antibiotic use

- **Tracking**
  - Monitor at least one process measure of antibiotic use and at least one outcome from antibiotic use in your facility

- **Reporting**
  - Provide regular feedback on antibiotic use and resistance to prescribing clinicians, nursing staff and other relevant staff

- **Education**
  - Provide resources to clinicians, nursing staff, residents and families about antibiotic resistance and opportunities for improving antibiotic use

www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
Leadership Commitment

- Written statement of support for antimicrobial stewardship program (ASP)
- Outline duties of the ASP team members
- Communicate expectations with the nursing staff and prescribing providers
- Create culture that promote appropriate antibiotic use
Appendix 1. Sample Leadership Support Statement for Antimicrobial Stewardship Program

[Facility Logo]

FROM: [Executive Director, Medical Director, Director of Nursing, etc.]

DATE: [Date]

RE: Antimicrobial Stewardship Program

Antibiotics are among the most commonly prescribed medications within long-term care facilities. However, misuse of antibiotics can lead to undesirable outcomes including emergence of multidrug resistant pathogens, development of Clostridium difficile infections, adverse drug reactions, increased mortality, and higher costs.

As part of the continuing commitment to provide high quality care to all our residents, the leadership team of [facility name] has created an Antibiotic Stewardship Program (ASP). This program will promote appropriate use of antibiotics in our facility. The overall goal of ASP is to prevent undesirable outcomes related to antibiotic misuse by optimizing the selection of drug, dose, route, and duration of therapy. Antibiotic use protocols and systems to monitor antibiotic use will be implemented to achieve ASP goals.

The ASP will be a part of the facility’s Infection Prevention and Control Program. Infection preventionist will play a central role and the key leaders accountable for the program include [Medical Director, Director of Nursing, Consultant Pharmacist, etc.]. This multidisciplinary team will regularly review appropriateness of antibiotic courses and make recommendations for adjustment in practice where necessary, establish new or revise existing protocols relevant to appropriate antibiotic prescribing, monitor and report patterns of antibiotic use and resistance; and provide education on responsible use of antibiotics.

The success of this initiative requires the full participation and support of those who prescribe, prepare, administer, and receive antimicrobial therapy. The facility will provide adequate staffing and resources to support the functions and goals of the ASP. ASP team will engage prescribing providers, staff, residents, and residents’ families to ensure that antibiotic use protocols can be implemented smoothly. Facility leadership is confident that with the help of frontline staff, support of prescribing providers, understanding of resident and families, and guidance of ASP team, we will improve quality of care and minimize untoward consequences of antibiotic therapy.

https://asap.nebraskamed.com
Accountability

• Empower leaders of the program
  • Medical Director
  • Director of Nursing
  • Consultant Pharmacist
• Provide dedicated time for ASP team for ASP activities including dedicated time for the leaders and for IPs who will support day to day activities of ASP
• Make the team accountable
• Develop partnerships:
  • Consultant laboratory
  • State and local health department
  • Nebraska ASAP (Resource for the state of Nebraska)
Antibiotic Stewardship Committee/Team

**Required (in my opinion)**

- Infection Preventionist
- Medical Director or a designated lead physician
- Director of Nursing or Assistant Director of Nursing
- Consultant Pharmacist

**Optional**

- Administrator
- Prescribing Provider (Attending Physician, Nurse Practitioner or Physician Assistant)
- Nurse representative
- Nurse Aid representative
- Allied Health Professional
- Representative from the Resident and Family Council

Medical Director, Director of Nursing and/or Consultant Pharmacist can be the leader(s) accountable for the program either by themselves or jointly but in my opinion Medical Director has to be one of them.
Drug Expertise

• Establish access to individuals with antibiotic expertise to implement antibiotic stewardship activities

• Examples of experts include:
  
  • Consultant pharmacist who has received specialized infectious diseases or antibiotic stewardship training
  • Antibiotic stewardship program leads at the hospitals within your referral network.
  • Develop relationships with infectious disease consultants in your community
Actions

• Policies that support optimal antibiotic use
• Broad interventions
  – Algorithms for resident assessments
  – Communication tools
  – Antibiograms
  – Antibiotic-time outs
  – Program to prescribe antibiotic for shortest duration needed to treat infection
• Pharmacy interventions (monitoring for adverse reactions and review of labs, cultures etc.)
• Infection and syndrome specific interventions (reduce antibiotic use for asymptomatic bacteriuria and antibiotic prophylaxis for UTI; optimize management of pneumonia and the use of chronic wound cultures)
Antibiotic Use Protocols

Antibiotic use policy/protocols of LTCF should:

• Mandate all antibiotic orders to have appropriate dose, duration and indication.

• Recommend using narrowest spectrum antibiotic appropriate for the condition being treated.

• Encourage prescribing providers to prescribe antibiotics according to evidence based guidelines and facility specific recommendations (where applicable).

• Promote reevaluation of the need for antibiotics based on clinical response and the results of the diagnostic tests after 48 to 72 hours of antibiotic initiation (i.e. antibiotic time out)

• Provide strategies to optimize antibiotic use in the areas identified as targets for further improvement (which can also be achieved by utilizing already available evidence based tools).
Utilizing Algorithms to Decrease Inappropriate Urine Cultures and Treatment of Asymptomatic Bacteriuria

Loeb M et al. BMJ. 2005 Sep 24;331(7518):669
Available Communication Tools

Suspected SST SBAR

Complete this form before contacting the resident's physician.

Nursing Home Name __________________________

Resident Name ___________________________ Date of Birth ______

Physician/NP/PA ___________________________ Phone ______

Fax ________________

Nurse ___________________________ Facility Phone ______

Submitted by □ Phone □ Fax □ In Person □ Other ______

S Situation

I am contacting you about a suspected SST for the above resident.

Suspected LRI SBAR

Complete this form before contacting the resident's physician.

Nursing Home Name __________________________

Resident Name ___________________________ Date of Birth ______

Physician/NP/PA ___________________________ Phone ______

Fax ________________

Nurse ___________________________ Facility Phone ______

Submitted by □ Phone □ Fax □ In Person □ Other ______

S Situation

I am contacting you about a suspected LRI for the above resident.

Suspected UTI SBAR

Complete this form before contacting the resident's physician.

Nursing Home Name __________________________

Resident Name ___________________________ Date of Birth ______

Physician/NP/PA ___________________________ Phone ______

Fax ________________

Nurse ___________________________ Facility Phone ______

Submitted by □ Phone □ Fax □ In Person □ Other ______

S Situation

I am contacting you about a suspected UTI for the above resident.

https://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/toolkit3-minimum-criteria.html
A modified single page version of communication tool for suspected UTI is available at Nebraska ASAP Website.

Sample Communication tool for **Antibiotic Time out** is also available at Nebraska ASAP website.

Track and Report Antibiotic Use and Outcome Data

- **Process Measure**
  - How and why antibiotics are prescribed

- **Antibiotic Use Measure**
  - How often and how many antibiotics are prescribed

- **Outcome Measure**
  - Adverse Outcomes
    - *C. difficile* infections
    - Antibiotic resistant organisms
    - Adverse drug events/reactions
  - Antibiotic related cost
Suggested Data Collection When Initiating a New Program

- **Antibiotic Use**: (Examples are as follows:)
  - Number of antibiotic starts/ 1000 resident days
  - Antibiotic days of therapy/ 1000 resident days
  - Proportion of antibiotic starts not satisfying Loeb’s and/or revised McGeer criteria

- **C. difficile** infection rate

- **MDRO** infection rate

Resources for review to see whether criteria met:

Additional Data Collection

- Tracking adherence to antibiotic stewardship protocols/procedures (Example are as follows:)
  - Completeness of clinical assessment documentation at the time of antibiotic prescriptions
  - Completeness of antibiotic prescribing documentation

- Antibiogram
What is an Antibiogram?

• A report that summarizes the susceptibilities to various antibiotics for all the organisms present in clinical specimens that nursing homes send for laboratory testing aggregated across all residents for a certain time.

• Many microbiology lab can provide a facility specific antibiogram upon request.

• It can also be developed manually by the nursing homes.

• Resources can be found at:

## Concise Antibiogram Toolkit
### Comprehensive Antibiogram Template

<table>
<thead>
<tr>
<th>Gram (-)</th>
<th>Aminoglycosides</th>
<th>B-Lactams</th>
<th>Cephalosporins</th>
<th>Quinolones</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Residents</td>
<td>Amikacin</td>
<td>Gentamicin</td>
<td>Tobramycin</td>
<td>Ampicillin-Clavulanate</td>
</tr>
<tr>
<td>Acinetobacter baumannii</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citrobacter freundii</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Citrobacter koseri</td>
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<tr>
<td>Citrobacter sp</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td></td>
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</tr>
<tr>
<td>Enterobacter cloacae</td>
<td></td>
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<td></td>
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<tr>
<td>Enterobacter sp</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escherichia coli</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Klebsiella oxytoca</td>
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</table>

Available at: [https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/5_TK2_T5-Concise_Antibiogram_Toolkit_Comprehensive_Antibiogram_Template.pdf](https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/5_TK2_T5-Concise_Antibiogram_Toolkit_Comprehensive_Antibiogram_Template.pdf)
Identify Targets for Improvement

Based on the initial data collection for antibiotic stewardship program identify priority areas to focus on for further interventions.

Examples are:

- Unnecessary treatment of asymptomatic bacteriuria,
- Unnecessary urine culture orders
- Use of antibiotics for viral upper respiratory tract infections.
- Use of superficial wound swab culture
- Excessive length of therapy
- Antibiotic prescriptions lacking dose, duration and indication.
- Use of broad-spectrum agents

Most long-term care facilities may find the first 2 examples as the most important drivers of antibiotic use in their facilities.
Reporting Process

• Antibiotic Stewardship Committee/team will be part of Infection Control and Prevention Program (IPCP).

• It will report progress to the Quality Assurance and Performance Improvement (QAPI) program

• New CMS rules mandate IPCP to be reviewed at least annually.

• It will be reasonable, for Antibiotic stewardship team to meet at least quarterly and report to QAPI program at least annually although facility will have to factor in multiple factors/issues/projects to come up with the frequency of these meetings.

• In addition to reporting antibiotic stewardship related issues/irregularities/progress to QAPI program, reports should also be developed for frontline staff and prescribing providers.

• Also share facility specific antibiograms with all the prescribing providers.
Education

- Educational programs should address both nursing staff and clinical providers on the need of antibiotic stewardship program and its goals, along with the responsibility of each group for ensuring its implementation.

- Facilities should also provide education on appropriate use of antibiotics and dangers of antibiotic misuse to residents and their family members and engage them in stewardship efforts.

Resources are available at:

http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/asp/ltc/

https://nursinghomeinfections.unc.edu/

https://www.cdc.gov/longtermcare/index.html

https://www.coursesites.com/webapps/Bb-sites-course-creation-BBLEARN/handleSelfEnrollment.htmlx?course_id=348931_1
Some Available Resources

https://asap.nebraskamed.com Accessed August 24, 2017


https://nursinghomeinfections.unc.edu/ Accessed August 24, 2017


Conclusions

- Inappropriate antibiotic use in long-term care facilities is a real problem.
- Antimicrobial stewardship programs in long-term care facilities have to be tailored to the need of a particular nursing home.
- Nursing Home administration will need to dedicate resources for program to be successful.
- Infection Preventionists have a central role in establishing and promoting these programs in the nursing homes.
- IPs should make sure that the program contains all 7 CDC recommended core elements.
Thank You

Questions?