Bugs, Drugs, and No More Shoulder Shrugs: The Role for Antimicrobial Stewardship in Long-term Care

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Learning Objectives

• Understand the need for antimicrobial stewardship (AMS) in long-term care facilities
• Define the principles of AMS
• Discuss the federal and local requirements for AMS in long-term care
• Explore AMS strategies that have been successful in the long-term care setting
• Navigate useful resources for developing your own program
Houston Study Sheds Light On Drug-Resistant Bacteria Problem

Research at a local hospital shows how certe changing.

TRAVIS BURBNIK | JULY 24, 2017, 5:55 PM

Harrowing tales from a superbug’s battle to the death with the latest antibiotic

500,000 People Die Every Year from Infections Caught in Long-Term Care Facilities

Despite longer live spans, almost half a million people die of healthcare-associated infections (HAIs) each year, many of them preventable.

The decision to move a loved one into a long term care facility is difficult. Besides worry about how an elderly loved one will adjust, there are concerns about care, potential abuse, and infection.
Examples of How Antibiotic Resistance Spreads

- Animals get antibiotics and develop resistant bacteria in their guts.
- Drug-resistant bacteria can remain on meat from animals. When not handled or cooked properly, the bacteria can spread to humans.
- Fertilizer or water containing animal feces and drug-resistant bacteria is used on food crops.
- Drug-resistant bacteria in the animal feces can remain on crops and be eaten. These bacteria can remain in the human gut.
- George gets antibiotics and develops resistant bacteria in his gut.
- George stays at home and in the general community. Spreads resistant bacteria.
- George gets care at a hospital, nursing home or other inpatient care facility.
- Resistant germs spread directly to other patients or indirectly on unclean hands of healthcare providers.
- Patients go home.
- Resistant bacteria spread to other patients from surfaces within the healthcare facility.
Other Perils of Antibiotics in Long-term Care

• Patient population is older
  – Higher rates of adverse drug events
  – *Clostridium difficile* infections
  – Polypharmacy
  – Altered pharmacokinetics

• Increased cost
  – Unnecessary therapy

Implications for Long-term Care

![Graph showing cumulative incidence of MDROs over time]

- **Any MDRO**: 175 participants at baseline, 116 at 3 months, 93 at 6 months, 71 at 9 months, 61 at 12 months.
- **MDRGNB**: 200 participants at baseline, 145 at 3 months, 124 at 6 months, 93 at 9 months, 85 at 12 months.
- **MRSA**: 278 participants at baseline, 218 at 3 months, 184 at 6 months, 160 at 9 months, 151 at 12 months.

Implications for Long-term Care

Lim et al, 2014

• 36% of the residents carried 1+ multidrug resistant (MDR) organism

• Risk factors a/w MDR organisms
  — Penicillin, fluoroquinolone, cephalosporin use in last year
  — Prior antibiotic exposure
  — >14 days of antibiotic use in last 3 months

Antibiotic Development

- Fewer new agents to advance treatment of infection
- Few new mechanisms of action
- Little interest from US/European drug manufacturers

Figure 1. New antibacterial agents approved in the United States, 1983–2007, per 5-year period [2, 3].

AMS: Definition

Coordinated interventions designed to improve and measure the appropriate use of antibiotic agents by promoting the selection of the optimal antibiotic drug regimen including: dosing, duration of therapy and route of administration

Focus on the 5 Ds

• **Diagnosis**
  – Communication
  – Evidence-based

• **Drug**
  – Effective agent?
  – Adverse effects?
  – Lab data

• **Dose**
  – Consider comorbidities
  – Interactions

• **Duration**
  – Guidelines/protocol

• **De-escalation**
  – “time-out”
  – Narrow spectrum
  – Oral over parenteral
  – Discontinue when unnecessary
AMS: Objectives

• Achieve best clinical outcomes while minimizing toxicity and adverse events
• Limit selective pressure on bacterial populations that drive resistance
• Reduce costs due to suboptimal or inappropriate antibiotic use

AMS: Multidisciplinary Initiative

- Physician
- Pharmacist
- Clinical microbiologist
- Infection preventionist
- Other caregivers
AMS: Multidisciplinary Initiative

Medical director

Infection Preventionist

Prescribers

Nursing services director

Various others:
• ID/stewardship consultant
• Local hospital team
• Telemedicine
• Consultant pharmacist

AMS: Minimum Requirements

- Limited formulary with nonduplicative antibiotics
- Facility specific guidelines/algorithms
- Antibiotic review at time of use
- Analyze trends/set benchmarks
- Development and distribution of facility antibiogram
- Education about resistance and stewardship
- Support from leadership

CDC. Core elements of antibiotic stewardship for nursing homes, 2016.
AMS: Old CMS Requirements

• F-tag 880: Infection prevention and control
  – Previously F-Tag 441
  – Requires infection prevention and control program
    • Prevent/investigate/control active infections
    • Collectanalyze data on infections acquired in facility
• F-tag 757: Drug regimen is free from unnecessary drugs
  – Previously F-tag 329/428
  – Requires appropriate dose, duration, indication for all medications
AMS: New CMS Requirements

• F-Tag 881: Antimicrobial Stewardship Program
  – Antibiotic use protocol
  – System to monitor antibiotic use

• F-Tag 882: Infection Preventionist
  – Designate a facility representative to oversee IPCP
    • Primary training: nursing, medication technology, microbiology, epidemiology
    • Member of facility’s quality assessment and assurance committee
AMS: Texas Requirements

19.1501 Pharmacy Services
   – Drug regimen review- monthly review for appropriate indication, dose, duration

19.1601 Infection Control
   – Establish and maintain an infection control program
   – Quality assessment and assurance committee will monitor the infection control program
Implementing AMS in Long-term Care

Challenges to implementation

• Resources
• Patients
• Processes
• Data
Strategies for Implementation

Reactive Strategies
• Retrospective chart review

Other Strategies
• Specialty consults
• Time-outs

Proactive Strategies
• Order entry
• Education
• Protocols
AMS Strategies: Chart Review

- 60 bed long-term care facility in Dallas
- Chart review by antimicrobial stewardship team for 1 hour every week
- Recommendations to optimize therapy were made via communication order
- Resulted in:
  - 80% of recommendations accepted
  - 21% reduction in antibiotic use
  - 28% reduction in cost per patient day
AMS Strategies: Consults

• ID consult service at VA long-term care facility
  – Rounded weekly/available by phone
• Resulted in:
  – Less antibiotic use/CDI

AMS Strategies: Timeout

• 48 hours after initiation, consider:
  — Can antibiotic be stopped?
  — Can antibiotic be narrowed?
  — Duration of therapy?

• University hospital study outcomes with timeout
  — Reduce costs
  — 1 in 7 patients had therapy changes

AMS Strategies: Order Entry

• Indication/duration
  — Benefits:
    • Improve safety/quality of prescribing
    • Improve appropriateness of use of antimicrobials
    • Educate and empower patients
    • Improve communication
  — Challenges
    • Time and effort for prescribers
    • Limited evidence

AMS Strategies: Targeted Education

• Asymptomatic bacteriuria
  – Education for nursing staff and providers via sessions and print materials
• Criteria for obtaining cultures/diagnosis of UTI/empiric antibiotic therapy
• Feedback for inappropriate decision making

<table>
<thead>
<tr>
<th></th>
<th>3-Month preintervention</th>
<th>Initial 6 months postintervention</th>
<th>7 to 30 Months postintervention</th>
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<tbody>
<tr>
<td>Patient-days, n</td>
<td>13,151</td>
<td>27,846</td>
<td>124,849</td>
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<tr>
<td>Total urine cultures sent</td>
<td>49</td>
<td>43</td>
<td>164</td>
</tr>
<tr>
<td>Total urine cultures sent/1000 patient-days (95% CI)</td>
<td>3.7 (2.8-4.9)</td>
<td>1.5 (1.1-2.1)</td>
<td>1.3 (1.1-1.5)</td>
</tr>
<tr>
<td>Inappropriate cultures, n (%)</td>
<td>34 (69.4)</td>
<td>26 (60.5)</td>
<td>75 (45.7)</td>
</tr>
<tr>
<td>Inappropriate cultures/1000 patient-days (95% CI)</td>
<td>2.6 (1.8-3.6)</td>
<td>0.9 (0.6-1.4)</td>
<td>0.6 (0.5-0.8)</td>
</tr>
<tr>
<td>Total ASB identified</td>
<td>34</td>
<td>26</td>
<td>75</td>
</tr>
<tr>
<td>ASB treated, n. (%)</td>
<td>23 (67.6)</td>
<td>18 (69.2)</td>
<td>33 (44.0)</td>
</tr>
<tr>
<td>ASB treated/1000 patient-days (95% CI)</td>
<td>1.7 (1.1-2.6)</td>
<td>0.6 (0.4-1.0)</td>
<td>0.3 (0.2-0.4)</td>
</tr>
<tr>
<td>Antimicrobial days of therapy/1000 patient-days</td>
<td>167.7</td>
<td>117.4</td>
<td>109.0</td>
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AMS Strategies: Protocol and Education

• 360 bed long-term care facility in Chicago
  – Intervention:
    • 4 sessions teaching session series for prescribers
    • 1 session for nursing leadership
    • Pocket sized booklets with algorithm/guidelines
      – Assessment and diagnosis
      – Appropriate antibiotic therapy

AMS Strategies: Protocol and Education

Resources for Implementation

- CDC Core Elements of Antibiotic Stewardship for Nursing Homes
Resources for Implementation

- Antimicrobial Stewardship Program Toolkit for Long-term Care Facilities (Minnesota Department of Health)
Resources for Implementation

- Massachusetts Coalition for the Prevention of Medical Errors Initiatives
Conclusions

• Antibiotic resistance can not be ignored
• Antibiotic stewardship has implications for patient welfare
• Long-term care facilities will need to develop practical, meaningful approaches to AMS
  – Assess resources
  – Create a team
• Reassess interventions to determine future directions/ revisions
Questions