Antibiotic Stewardship in Nursing Homes

Great Plains Quality Innovation Network
October 19th 2017

Sarah Kabbani, MD, MSc
Medical Officer, Office of Antibiotic Stewardship
Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention
Objectives

- Highlight the importance of antibiotic stewardship in nursing home and in new regulations
- Define the Core Elements of antibiotic stewardship for nursing homes
- Discuss actions that can be taken to promote stewardship activities
Antibiotics are frequently prescribed in nursing homes.
A large number of Americans with increasing medical complexity reside in nursing homes.

- Around 4 million Americans are admitted to or reside in a nursing home during a year\(^1\)
- 35\% age ≥ 65 will receive nursing home care in their lifetime\(^2\)
- By 2060 the number of Americans ≥ 65 will double\(^3\)
- Residents at NH have increasingly more complex medical conditions\(^4\)

---

2. https://assets.aarp.org/rgcenter/il/fs10r_homes.pdf
Antibiotics are frequently prescribed in nursing homes.

- Estimated 50-70% of residents will be prescribed an antibiotic in a year\(^1,2\)
  - Based on limited data

- One day point prevalence survey of antibiotic use in U.S. nursing homes\(^3\)
  - December 2013-May 2014, 9 U.S. NH, 1,272 residents
  - Median age 85 years (range 21-91), 70% were female, 14% were short stay
  - Total AU was \textbf{11.1\%} (95\% CI 9.4-12.9\%)
    - 23\% of AU was for prophylaxis
    - The most common indication for treatment was UTI (32\%)
    - AU was more common in short stay residents (21.2\%) and residents with devices (23.5\%) p-value < 0.0001

Antibiotic prescribing in nursing homes is frequently inappropriate.

- Estimated 40-75% of antibiotic use in nursing homes is inappropriate\(^1,2\)
  - Diagnosis: treatment may not be indicated
  - Drug: antibiotic selection may not be correct
  - Dose: dosing may be inappropriate or not adjusted
  - Duration: longer than recommended guidelines
  - De-escalation: not adjusted based on clinical condition or laboratory results
  - Documentation: should reflect all D’s above

Testing and antibiotic prescribing for urinary tract infections in nursing homes is frequently inappropriate.

- Asymptomatic bacteriuria is common in nursing home residents\textsuperscript{1,2}

- Up to half of antibiotics prescribed to treat urinary tract infection in older adults are unnecessary or inappropriate\textsuperscript{3,4}.
  - Appropriateness of AU for UTI ranged from 15-45\% depending on appropriateness criteria applied\textsuperscript{5}

- Overtesting could lead to incorrectly diagnosing urinary tract infections, inappropriate treatment, adverse drug events and delays in diagnosis\textsuperscript{6}

Antibiotics save lives but increase the risk of adverse events in older adults.

- Antibiotics were the second most common drug class causing outpatient ADEs in older adults\(^1\)

- Polypharmacy is associated with an increased risk of ADEs in older adults:\(^2\)
  - The odds of adverse events increases with the number of regularly scheduled medications in residents in nursing homes

- Antibiotics contribute to clinically significant drug interactions
  - Antibiotic prescribing increases the risk of bleeding in patients on warfarin.\(^3\)

Antibiotics are a common cause of adverse drug events in nursing homes.

- 13% of adverse drug events are secondary to antibiotic use\(^1\)
- Residents of high antibiotic use nursing homes had a 24% greater risk of antibiotic-related adverse events compared to low antibiotic use nursing homes\(^2\)
  - Each additional day of antibiotic use leads to a 0.4% increased risk of antibiotic-related harm
- Risk of acquiring *Clostridium difficile* infection and subsequent complications including death are greatest in older adults\(^3\)
  - Up to 25% of patients can have recurrent disease after treatment
- In Ohio 2006, >50% of healthcare-associated *C. difficile* infection with onset likely in nursing homes\(^5\)

Nursing home residents can spread antibiotic resistant bacteria to other residents in the nursing home and in other health care settings.

- Antibiotic exposure is one of the most important risk factors associated with the development of antibiotic resistance\(^1,2\)

- Residents who develop colonization with antibiotic resistant bacteria can spread these organisms to other residents\(^3,4\)

- Nursing homes are a key part of our interconnected healthcare system
  - Genetic and epidemiological studies of MRSA and carbapenem-resistant Gram-negatives highlighted transmission and interconnectedness of nursing homes to acute hospitals and other sites\(^5\)

The antibiotic prescribing process in nursing homes is challenging.

- Antibiotic prescribing in nursing home is frequently made off site and influenced by nursing staff communication.
- The process of antibiotic prescribing in NH is complex and faces barriers that are different from the acute care and ambulatory settings.
  - Clinical uncertainty related to resident factors and limited resources
  - Decision to initiate antibiotics
    - 66% of antimicrobial prescriptions were started by telephone orders
    - Transitions in care
  - Limited documentation of assessment and decision making process
    - For 38% of antibiotics administered, key prescribing information were not documented
  - High staff turnover
  - Family preferences influence treatment decisions

Antibiotic Stewardship Core Elements provide a framework to improve antibiotic prescribing in nursing homes.
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.

- Antimicrobial stewardship includes:
  - Measuring antibiotic prescribing
  - Improving antibiotic prescribing
  - Minimizing misdiagnoses or delayed diagnoses
  - Ensure that the right drug, dose, and duration are selected

- Antimicrobial stewardship interventions can lead to:
  - Improved individual resident outcomes
  - Prevention of the emergence of antibiotic resistance
  - Saving healthcare dollars
Infection Prevention and Antibiotic Stewardship Drivers in Nursing Homes

- **2013**: HHS National Action Plan to Prevent Healthcare Associated Infections
- **2014**: Office of Inspector General Report
- **2015**: White House Stewardship Forum
- **2015**: CDC Core Elements of Antibiotic Stewardship in Nursing Homes

- **2013**: CDC Antibiotic Resistant Threats Report
- **2015**: National Action Plan for Combating Antibiotic Resistant Bacteria
- **2015**: CMS New Regulatory Proposal for Long Term Care Facilities
- **2016**: CMS Regulatory Requirements Finalized
Centers for Medicare and Medicaid services reformed requirements of participation for long term care facilities.

- On October 4th 2016 CMS finalized long term care requirements of participation that would require antibiotic stewardship to become part of infection prevention and control programs (IPC) and pharmacy services

  - Antibiotic Use Protocols and monitoring included in IPC programs- **effective Nov 2017**

CDC Core Elements of Antibiotic Stewardship for Nursing Homes provide a framework for antibiotic stewardship implementation.

Provide a framework for assessing current and new antibiotic stewardship activities, and for monitoring and improving antibiotic use:

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

http://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
Leadership, Accountability and Drug Expertise: Identify and provide support to the team that will lead antibiotic stewardship implementation.
Leadership commitment is essential to provide support for antibiotic stewardship implementation.

- NH leaders commit to improving antibiotic use
- Identify the leaders in your facility:
  - Owners, facility administrators, regional and national leaders
- Examples of ways of demonstrating support
  - Write statements in support of improving antibiotic use and share with staff, residents and families
  - Include stewardship related duties in position descriptions for medical director, clinical nurse leads and consultant pharmacists
  - Communicate the facilities expectations on antibiotic use and stewardship policies with nursing staff and prescribing clinicians
  - Create a culture through messaging, education and a celebrating improvement
Accountability: Identifying individuals who will lead antibiotic stewardship implementation.

- Identify physician, nursing and pharmacy leads responsible for promoting and overseeing antibiotic stewardship activities
  - Medical Director
    - Set standards for antibiotic prescribing practices for all healthcare providers
    - Review antibiotic use data and oversee adherence to antibiotic prescribing practices
  - Nursing Director
    - Set practice standards to assess, monitor and communicate changes in residents’ condition
    - Assess knowledge and perceptions about the role of antibiotics in the care of residents, and convey expectation of antibiotic stewardship
  - Consultant Pharmacist
    - Quality assurance activities, medication regimen review and reporting antibiotic use data
Accountable individuals can use existing resources.

- Antibiotic stewardship leads can utilize existing resources
  - Infection prevention and control coordinator
    - Tracking antibiotics, monitoring adherence to prescribing practices
  - Consultant Laboratory
    - Alerting facilities if antibiotic resistant organisms are identified
    - Education about differences in diagnostic testing (i.e. different test for *C. difficile*)
    - Creating antibiograms to help with empiric antibiotic selection and monitor for resistance
  - State and local health departments
    - Educational support and resources on antibiotic stewardship and infection prevention by the Healthcare-Associated Infections prevention programs
Individuals with drug expertise can provide support for antibiotic stewardship implementation.

- Establishing access to consultant pharmacists or other individuals with antibiotic expertise
  - Consultant pharmacist with specialized infectious disease or antibiotic stewardship training
  - Partner with antibiotic stewardship leads in referring hospitals in network
  - Develop relations with infectious disease consultants in the community who are interested in supporting the antibiotic stewardship efforts in your facility
Action, Tracking and Reporting: Identify actions to improve antibiotic use, track and report measures related to antibiotic use and resident outcomes.
Action: Implementing antibiotic prescribing policies that will improve antibiotic use.

- Implement at least one policy or practice to improve antibiotic use, ideally in a stepwise fashion.

- Antibiotic prescribing and use policies
  - Documentation of dose, route, duration and indication for every antibiotic course
  - Develop facility specific treatment guidance for common infections based on practice guidelines.

Action: Implementing practice policies that improve communication.

- Broad practice improvements
  - Standardize the assessment of patients suspected of an infection and the communication between onsite nursing and offsite providers
    - Ask providers’ and nurses’ input on barriers and opportunities for improvement
    - Ensure staff is communicating all the relevant data to make appropriate treatment decisions
    - Consider using Standard Assessment and Communication Tools i.e. SBAR

**Action: Improved communication in transitions in care**

- There are critical gaps in communication between residential care facilities and emergency departments\(^1\)

- The use of standardized transfer forms can improve the communication of critical information related to resident care when transferring to the emergency department\(^2,3\)

- CDC inter-facility infection control transfer form documents transmission based precautions, infection with antibiotic resistant organisms and antibiotic treatment information\(^4\)

---

4. [https://www.cdc.gov/hai/pdfs/toolkits/InfectionControlTransferFormExample1.pdf](https://www.cdc.gov/hai/pdfs/toolkits/InfectionControlTransferFormExample1.pdf)
Action: Implement specific policies that will minimize unnecessary prescribing for infections that drive inappropriate use.

- Broad practice improvements
  - Develop best practices for microbiology testing
    - Avoiding “test of cure” for UTI or *C. difficile* infection
  - “Antibiotic Time-Out” reassessing treatment 2-3 days after antibiotic start based on clinical condition and laboratory results

- Infection and syndrome specific practice improvements
  - Identify drivers of inappropriate use and implement specific interventions i.e. asymptomatic bacteriuria or prophylaxis for urinary tract infections
Nursing Home Core Elements: Appendix A-Policy and practice actions to improve antibiotic use.

- Evidence-based examples of policies, actions and interventions that to improve antibiotic prescribing

Tracking antibiotic use and outcomes will inform antibiotic stewardship implementation.

- Monitor antibiotic use and outcomes to guide practice changes
  - Process measures: how and why antibiotics are prescribed
  - Antibiotic use measures: how often are antibiotics prescribed
  - Outcome measures: adverse events and cost of antibiotics
Tracking: Antibiotic use data can be obtained from different sources.

- Electronic Health records can provide medication administration data
  - May be limited in some facilities

- Dispensing data from long term care pharmacies
  - Provides data on drugs dispensed and not administered

- Manual data collection

http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/asp/ltc/
Tracking: Antibiotic use can be reported using different measures.

- Antibiotic use can be reported in several ways
  - Antibiotic starts/1,000 patient days
  - Days of antibiotic therapy/1,000 patient days
  - One day Point prevalence studies of antibiotic use

- Data recorded could be used to look at:
  - Time when antibiotics are started
  - Variations by provider
  - Common indication for use
  - Common agents prescribed
  - Duration of therapy

Tracking: Antibiotic related outcome measures can also be tracked.

- Reporting outcome measures is important to follow the effectiveness of interventions
  - Adverse events from antibiotics
  - Cost of antibiotics
    • Can be helpful in justifying support for staff and external consultant
  - Rates of *C. difficile* infection
  - Antibiotic susceptibility profiles
    • Work with clinical laboratory to develop an antibiogram for your facility
Nursing Home Core Elements: Appendix B-Measures of antibiotic prescribing, use and outcomes

- For more detailed examples of process, antibiotic use and outcome measures
- Includes information on CDC’s National Healthcare Safety Network (NHSN) Laboratory-identified event reporting module for long-term care facilities for antibiotic resistant organisms and *C. difficile*

Reporting antibiotic use and related outcomes is critical for the success and sustainability of antibiotic stewardship implementation.

- Provide regular feedback on antibiotic use and outcome measures to all relevant staff and stakeholders including clinicians and nursing
  - Motivate and sustain practice changes
  - Provider specific feedback and peer comparison is an effective way to change prescribing behavior
  - Improvement in clinical outcomes i.e. *C. difficile* rates, can increase support for stewardship activities
Providing education on antibiotic stewardship to all relevant stakeholders is key for the success of stewardship implementation.
Education-Staff

- Provide education about antibiotic stewardship to clinicians and nursing staff
  - May be the first element implemented to establish support among staff
  - Different mechanisms (flyers, newsletters..), strongest evidence for academic detailing (i.e. face-to-face interactive workshops)
  - Address staff concerns and barriers to changing antibiotic use practices

http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/asp/ltc/
https://nursinghomeinfections.unc.edu/
Education-Residents

- Develop resources and tools to engage residents and families to in stewardship education efforts, this will reduce barrier of resident and family expectations in improving antibiotic prescribing
- Start the conversation early with residents and their families

http://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
Where to start?

- Accompanying the core elements document, 2 page checklist to assess current practices
- Identify what practices are in place and opportunities to add new ones

Additional Resources: AHRQ Nursing Home Antimicrobial Stewardship Guide

- The Agency for Healthcare Research and Quality recently updated its NH antimicrobial stewardship guide that includes toolkits on:
  - Starting and monitoring an antimicrobial stewardship program
  - Communication and decision making for suspected infections
  - Using an antibiogram
  - Materials for resident and family engagement and education

http://www.ahrq.gov/nhguide/index.html
Success Story

- Massachusetts – Reducing CDI through antibiotic stewardship in LTC
- Building off previous success in acute care hospitals *C. difficile* prevention activities were extended into LTCF
- 16 LTCFs to reduce unnecessary antibiotic use for asymptomatic bacteriuria (ASB)
- Multifaceted educational intervention including in-person training on antibiotic use in UTI, dissemination of evidence-based UTI management algorithms, and patient/family engagement
- Compared of pre-intervention baseline to post-education rates over 1 year period:
  - Improved UTI diagnostic practices: **28%** decrease in urine cultures
  - Decrease in antibiotic use: **37%** reduction in treated ASB episodes
  - Decrease in complications from antibiotic use: **47%** reduction in healthcare acquired *C. difficile*

Courtesy of Nimalie Stone, DHQP, CDC
Future Plans

- Describe antibiotic use at the national, state and facility level
  - Working with proprietary prescribing data, and pharmacy and electronic health record vendors to capture antibiotic use data
  - Assessment of infections and antibiotic use in NHs through a multistate recruitment of 200 NHs within the CDC’s Emerging Infections Program
- Assess antibiotic stewardship practices in nursing homes
  - CDC’s Infection Control Assessment and Response (ICAR) activities in LTCFs
  - CMS CDI reporting project 2016-2018, facility survey includes assessment of stewardship practices
- Determine the best approaches to AS implementation
Resources

https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html

http://www.ahrq.gov/nhguide/index.html

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


http://www.mi-marr.org/LTC_toolkit.php

https://www.cdph.ca.gov/programs/hai/Pages/ASPinNursingHomesWebinarSeries2016.aspx


https://nursinghomeinfections.unc.edu/

https://robinjump.coursesites.com/

http://www.choosingwisely.org/patient-resources/antibiotics-for-people-with-catheters/

http://www.choosingwisely.org/patient-resources/antibiotics-for-urinary-tract-infections-in-older-people/