Centers for Disease Control and Prevention

Antibiotic Stewardship in Long-term Care Settings: Data for Action

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Division of Healthcare Quality & Promotion

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Speaker Disclosures

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

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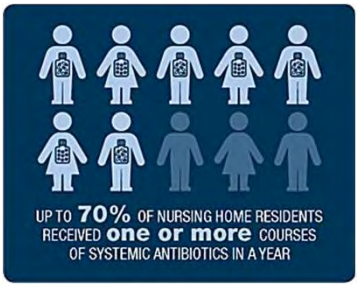
Learning Objectives

1. Discuss the framework and actions for implementing antibiotic stewardship in the long-term care setting.
2. Identify strategies for tracking of antibiotic use in long-term care settings.
3. Review opportunities to improve stewardship implementation in long-term care settings.

3

Antibiotics are frequently prescribed inappropriately in nursing homes.

- An estimated **50-70%** of NH residents will be prescribed one or more courses of systemic antibiotics in a year.
- In nursing homes, small studies have shown an estimated **40-75%** of antibiotic prescribing is inappropriate.



1. Lim et al. Clin Interven Aging. 2014 Jan 13;9:165-77.
2. Nicolle et al. Infect Control Hosp Epidemiol. 2000 Aug;21(8):537-45
3. Kabbani et al. ASHE. 2021 Dec: 1, e58, 1–7.

4

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

- **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]

1. Gurwitz et al. Am J Med. 2005 Mar;118(3):251-8.
2. Tamura et al, Clin Geriatr Med. 2012 May;28(2):217-36.
3. Field et al, Arch Intern Med. 2001 Jul 9;161(13):1629-34.
4. Corsonello et al, Clin Microbiol Infect. 2015 Jan;21(1):20-6.

5

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- 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]
- The intensity of antibiotic prescribing was significantly associated with prescribing of benzodiazepines, opioids and proton pump inhibitors[5]
  - Six times more likely to prescribe multiple drugs at a higher rate

1. Gurwitz et al. Am J Med. 2005 Mar;118(3):251-8.
2. Tamura et al, Clin Geriatr Med. 2012 May;28(2):217-36.
3. Field et al, Arch Intern Med. 2001 Jul 9;161(13):1629-34.
4. Corsonello et al, Clin Microbiol Infect. 2015 Jan;21(1):20-6.
5. Quinn et al, J Gen Intern Med. 2019 Dec;34(12):2763-2771

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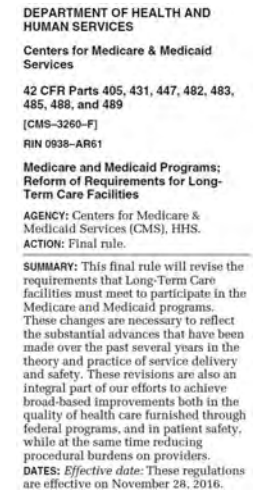
Policy Requirement for Antibiotic Stewardship.

- CMS issued a final rule **requiring** nursing homes to have antibiotic stewardship integrated within pharmacy and infection prevention and control programs (IPC)
  - An antibiotic stewardship program that includes **antibiotic use protocols** and a **system to monitor antibiotic use**
  - Interpretive guidance is based on the CDC's core elements of Antibiotic stewardship



DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Medicare & Medicaid Services

42 CFR Parts 405, 431, 447, 482, 483, 485, 488, and 489

[CMS–3260–F]

RIN 0938–AR61

Medicare and Medicaid Programs; Reform of Requirements for Long-Term Care Facilities

AGENCY: Centers for Medicare & Medicaid Services (CMS), HHS.

ACTION: Final rule.

SUMMARY: This final rule will revise the requirements that Long-Term Care facilities must meet to participate in the Medicare and Medicaid programs. These changes are necessary to reflect the substantial advances that have been made over the past several years in the theory and practice of service delivery and safety. These revisions are also an integral part of our efforts to achieve broad-based improvements both in the quality of health care furnished through federal programs, and in patient safety, while at the same time reducing procedural burdens on providers.

DATES: *Effective date:* These regulations are effective on November 28, 2016.

https://www.gpo.gov/fdsys/pkg/FR-2016-10-04/pdf/2016-23503.pdf

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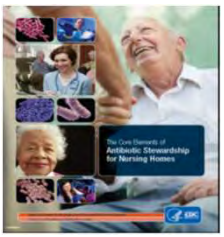
The Core Elements of Antibiotic Stewardship for Nursing Homes

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

- Leadership Commitment: demonstrate support and commitment
- Accountability: identify physician, nursing and pharmacy leads responsible for stewardship implementation
- Drug Expertise: establish access to individuals with experience and training
- Action: implement at least one policy
- Tracking: monitor at least one measure
- Reporting: provide regular feedback
- Education: provide educational resources to staff



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

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Leadership, Accountability and Expertise

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Leadership Commitment & Accountability

- Providing the necessary human and financial resources to implementing antibiotic stewardship
  - Including stewardship-related duties in position description
  - Statements of support, regular meetings with program leaders, communication with clinicians, reporting activities and outcomes
  - Appointing a "**champion**" to ensure that the program has resources and support to accomplish its mission

https://www.cdc.gov/longtermcare/pdfs/Stewardship-Committment-Poster-508.pdf

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Drug Expertise: Support for Antibiotic Stewardship Implementation.

https://www.cdc.gov/antibiotic-use/training/materials.html#anchor_1626372118971

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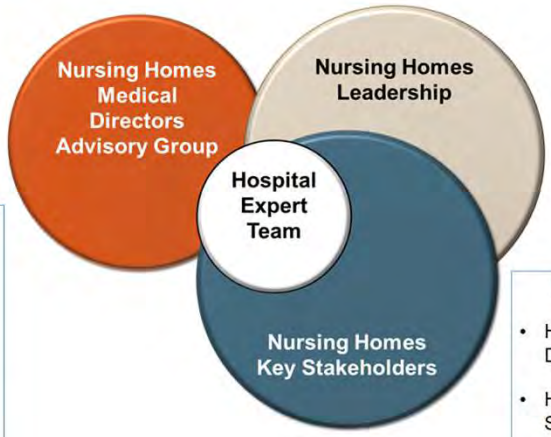
Hospital-Nursing Home Collaboration Structure

13 Medical Directors



Leadership
- Nursing Home Administrator
- Medical Director
- Director of Nursing
- Director of Quality

Hospital Expert Team
- Hospital Infectious Diseases Physician
- Hospital Antimicrobial Stewardship Pharmacist
- Project Infection Preventionist and Coordinator

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Felsen et al, J Am Med Dir Assoc. 2020 Jan;21(1):55-61.e2.
Slide curtesy of Ghinwa Dumyati

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Tracking and Reporting Antibiotic Use

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Tracking Antibiotic Use

- Monitoring antibiotic use can help identify opportunities for improvement and guide and monitor practice changes
- Antibiotic use can be tracked using:
  - Long-term Care (LTC) Pharmacies dispensing data
    - Dispense and deliver medications, provide drug regimen review and medication management, can generate reports on antibiotic days dispensed
  - Electronic Health Record Systems (EHR) order data:
    - Medication orders can used to generate antibiotic use reports
  - Manual Chart Review:
    - May be only the possible way to collect antibiotic use data in some facilities, can be added to infection tracking log

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Electronic Reporting of Antibiotic Use Data

Innovative methods to summarize nursing home antibiotic data

Christina B. Felsen MPH[1], Grant R. Barney BS[2] and Ghinwa K. Dumyati MD[1,3]

[1]Center for Community Health and Prevention, University of Rochester Medical Center, Rochester, New York, [2]University at Albany, School of Public Health, Albany, New York and [3]Infectious Diseases Division, University of Rochester Medical Center, Rochester, New York

Original Article

Description of antibiotic use variability among US nursing homes using electronic health record data

Sarah Kabbani MD, MSc[1], Stanley W. Wang MA, MS[2], Laura L. Ditz RN[2], Katryna A. Gouin MPH[2], Danielle Palms MPH[2], Theresa A. Rowe DO, MS[1,3], David Y. Hyun MD[4], Nancy W. Chi MHA[2], Nimalie D. Stone MD, MS[1] and Lauri A. Hicks DO[2]

Research Brief

Potential utility of pharmacy data to measure antibiotic use in nursing homes

Sarah Kabbani MD, MSc[1], Danielle L. Palms MPH[1], Monina Bartoces PhD[1], Joseph Marek BS[2], Nimalie D. Stone MD, MS[1], Lauri A. Hicks DO[1] and Robin L.P. Jump MD, PhD[3,4]

[1]Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA, [2]Communicare, Cincinnati, Ohio, USA, [3]Geriatric Research Education and Clinical Center (GRECC) and Specialty Care Center of Innovation at the Louis Stokes Cleveland, Department of Veterans Affairs Medical Center, Cleveland, Ohio, USA and [4]Division of Infectious Diseases & HIV Medicine, Department of Medicine and Department of Population and Quantitative Health Sciences, Case Western Reserve University School of Medicine, Cleveland, Ohio, USA

199. Evaluating long-term care pharmacy dispense data to monitor antibiotic use in U.S. nursing homes

Katryna A. Gouin, MPH[1]; Stephen M. Creasy, PharmD[2]; Manjiri Kulkarni, MS[2]; Martha Wdowicki, PharmD[2]; Nimalie D. Stone, MD, MS[3]; Lauri Hicks, DO[4]; Sarah Kabbani; [1]Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia; [2]PharMerica, Louisville, Kentucky; [3]CDC Division of Healthcare Quality and Promotion, Atlanta, GA; [4]Centers for Disease Control and Prevention, Atlanta, Georgia

Session: P-7. Antimicrobial Stewardship: Special Populations

TECHNICAL ADVANCE — Open Access

Use of electronic pharmacy transaction data and website development to assess antibiotic use in nursing homes

Sunah Song[1,2,3], Brigid M. Wilson[4,5], Joseph Marek[6] and Robin L. P. Jump[3,4,5*]

Kabbani S, et al. *Infect Control Hosp Epidemiol*. 2019;40(7):819-820. https://pubmed.ncbi.nlm.nih.gov/31014405/
Felsen CB, et al. *Infect Control Hosp Epidemiol*. 2019;40(10):1210-1211. https://pubmed.ncbi.nlm.nih.gov/31358073/
Gouin, K. et al. *Open Forum Infect Dis. 2020*; 7(Supplement_1):S104) https://academic.oup.com/ofid/article/7/Supplement_1/S104/6058292
Song S, et al., *BMC Med Inform Decis Mak*. 2021;21(1):148. https://pubmed.ncbi.nlm.nih.gov/33952239/
Kabbani, S., et al. *Antimicrobial Stewardship & Healthcare Epidemiology*. 2021; 1(1):E58. https://doi.org/10.1017/ash.2021.207

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Key Variables for Tracking Antibiotic Use

- Resident characteristics: Resident identifier, age, gender

- Antibiotic characteristic: Antibiotic class and agent, route of administration, **# of starts/courses**, **days of therapy (DOTs)**, **course duration**, indication

- Type of Nursing Home Stay:
  - Short Stay: ≤ 100 day stay in nursing home
  - Long Stay: > 100 day stay in a nursing home

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Tracking Antibiotic Use

- Antibiotic starts: Many nursing home IPC programs track new antibiotic starts as part of their infection surveillance activity.
  - Reflect the effort to decrease prescribing, can be tracked by indication
  - Does not capture duration
  - Multiple antibiotic dispenses/orders can be found in the LTC pharmacy or EHR systems for a single antibiotic course
    - To better capture duration of discreet courses, antibiotic starts can be replaced by the number of antibiotic courses

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Tracking Antibiotic Use

- Antibiotic days of therapy (DOT):
  - Total burden of use, better reflects efforts to decrease duration
  - Skewed by prophylaxis

Name	Date of Antibiotic Order or Transaction	Antibiotic Name	Calendar Days Antibiotic was Administered or Dispensed
Resident A	January 7	Nitrofurantoin	3
Resident B	January 7	Cephalexin	3
Resident A	January 10	Nitrofurantoin	2
Resident C	January 18	Ceftriaxone	7
Resident D	February 5	Vancomycin	10
Resident B	February 24	Ciprofloxacin	5
Resident B	February 24	Metronidazole	5

Month	Antibiotic DOT	Monthly Resident-Days	Rate of DOT/1,000 Resident-Days
January	(3+3+2+7)=15	200	(15/200)x1,000=75
February	(10+5+5)=20	250	(20/250) x1,000=80

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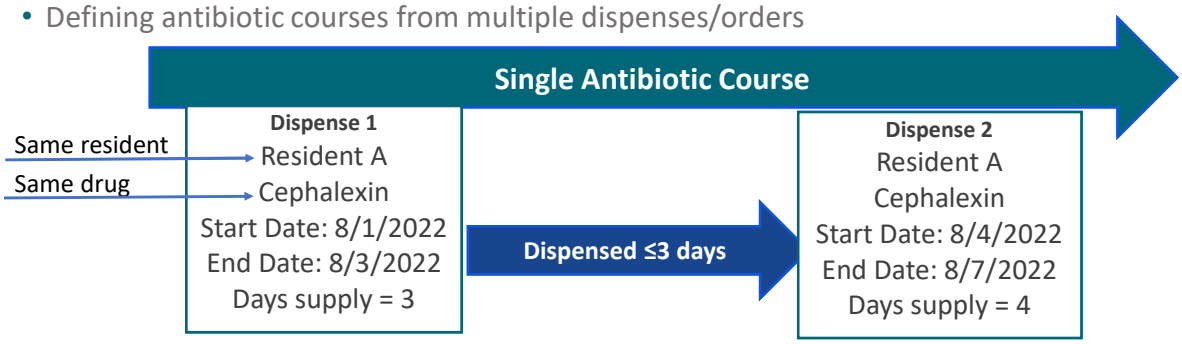
Tracking: Antibiotic Course

- Defining antibiotic courses from multiple dispenses/orders



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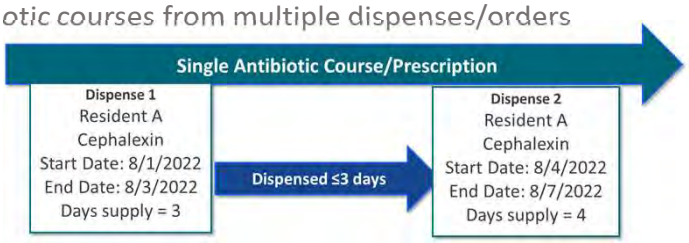

- Course duration: length of discreet antibiotic course (collapse dispenses/orders)

Sum of DOTs for all dispenses/orders in the course

3 days (Dispense 1) + 4 days (Dispense 2) = 7 days

OR

(End Date – Initial Start Date) + 1

8/7/2022 (Dispense 2 End Date) – 8/1/2022 (Dispense 1 Start Date) + 1= 7 days

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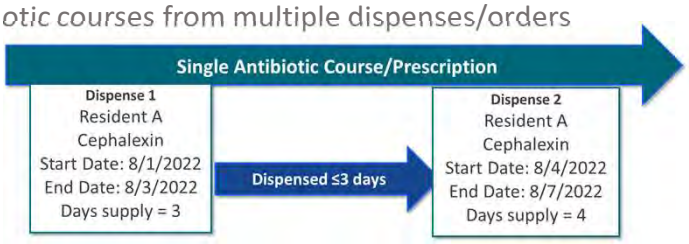
Tracking: Antibiotic Use Measures

- Defining antibiotic courses from multiple dispenses/orders



Antibiotic use rates (reported monthly, quarterly, yearly):

- Proportion of residents with antibiotic
- Antibiotic DOTs per 1,000 resident-days
- Antibiotic Courses per 1,000 resident-days
  - Mean course duration

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Long-term Care Antibiotic Use Data: Study Example

Data Source: LTC pharmacy data from 326,713 unique residents in 1,348 nursing homes
Antibiotic Courses: 576,288 dispenses → **324,306 antibiotic courses**

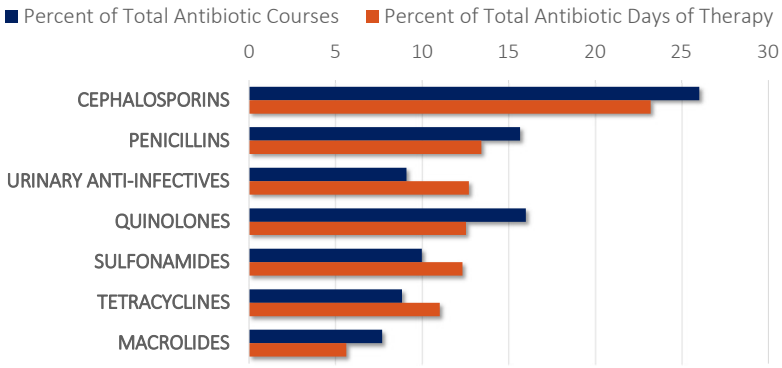
Proportion of Residents

45% of residents received an antibiotic

Antibiotic Use Rates

- 324,306 courses/38 million resident-days
  9 antibiotic courses/1,000 resident-days
- 3.3 million DOTs/ 38 million resident-days
  86 antibiotic DOT/1,000 resident-days

Antibiotic Courses and Days of Therapy by Antibiotic Class



Gouin, K. et al. (2020). *Open Forum Infect Dis* (Vol. 7, No. Supplement_1, pp. S104)

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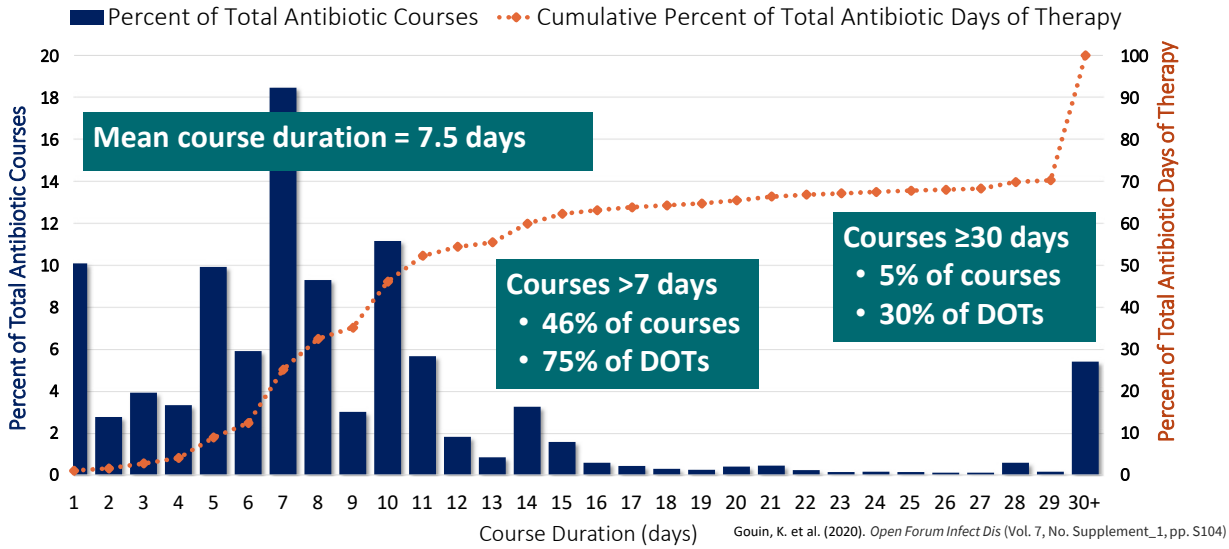

Gouin, K. et al. (2020). *Open Forum Infect Dis* (Vol. 7, No. Supplement_1, pp. S104)

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Infection Tracking Log

2019	Avg. Daily Census					Resident Days per Month																
Clinical Information												Treatment					Prescriber		Therapy				
Site of Infection	Meets McGeer's Criteria	Lab Identified C. difficile Infection (CDI)	MRSA Infection	Admitted with Infection	Health care Acquired - Nosocomial Infection	Temp	X-Ray Taken	Culture Taken	Foley	Trach	Causative Organism (list or "none found")	Class	Medication	Treatment	Follow-up De-escalation	Diagnosis	Was this antibiotic prescribed at the facility?	Who prescribed this antibiotic?	Start Date	Stop Date	Length of Therapy (days)	Reportable infections reported	Control Techniques Utilized
UTI	No	N/A	No	No	Yes	Yes	No	Yes	Yes	N/A	xxx	Penicillins	Ampicillin-	250 mg	Continue	UTI	No	David	3/2/2019	3/10/2019	9	No	Hosp did
Multi-Rx	Multi-Rx	Multi-Rx	Multi-Rx	Multi-Rx	Multi-Rx	Multi-Rx	Multi-Rx	Multi-Rx	Multi-Rx	Multi-Rx	yeast	Macrolides	Doxycycline	100mg QD	Narrow	UTI	No	Dr6	3/2/2019	3/11/2019	10	No	
UTI	Yes	Skin	Skin	No	Yes	Yes	No	Yes	Yes	N/A	pseudomon	Urinary_anti	Fosfomycin	2gm Bid	Discontinue	UTI	Yes	Dr4	3/9/2019	3/16/2019	8	No	Repeat due
UTI	Yes	N/A	No	No	Yes	Yes	No	Yes	N/A	No	influenza A	Anti_infectiv	Aztreonam	75mg Bid	Discontinue	influenza	Yes	Dr2	3/3/2019	3/7/2019	5	No	droplet
UTI	Yes	N/A	No	No	Yes	No	No	Yes	No	N/A	enterococcu	Penicillins	Amoxicillin	100mg Bid	Change	UTI	Yes	Dr4	3/9/2019	3/19/2019	11	No	
UTI	Yes	N/A	No	No	Yes	No	No	No	N/A	N/A	No culture	Fluoroquinol	Gatifloxacin	800-160mg	Discontinue	cellulitis	Yes	Dr1	3/9/2019	3/19/2019	11	No	
Skin	No	N/A	no		Yes							Penicillins	Amoxicillin	1gm IV	Continue	cellulitis	Yes	Dr2	3/22/2019	3/24/2019	3	No	
Resp	Yes	N/A	No	Yes	Yes	No	Yes	No	N/A	No	No culture	Cephalospor	Cefuroxime	500mg QD	Continue	bronchiti	No	Dr5	3/24/2019	3/28/2019	5	No	
UTI	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	MRSA	Fluoroquinol	Gatifloxacin	1.25-	Continue	Infected	No	Dr3	3/12/2019	4/13/2019	33	No	
UTI	No	N/A	No	No	Yes	No	No	Yes	No	N/A	e-coli	Macrolides	Clarithromycin	250mg Bid	Continue	UTI	Yes	Dr1	3/22/2019	3/27/2019	6	No	
GI	Yes	N/A	No	No	Yes	No	No	Yes	No	N/A	proteus	Anti_infectiv	Aztreonam	300mg Bid	Continue	UTI	Yes	Dr5	3/29/2019	4/5/2019	8	No	

https://www.brown.edu/academics/public-health/qandi/providers/infectionlog

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Reporting: Antibiotic Use and Outcomes.

- Providing regular feedback on antibiotic use to all relevant stakeholders important for the success and sustainability of stewardship practices
- 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.

Meeker et al, JAMA. 2016 Feb 9;315(6):562-70.

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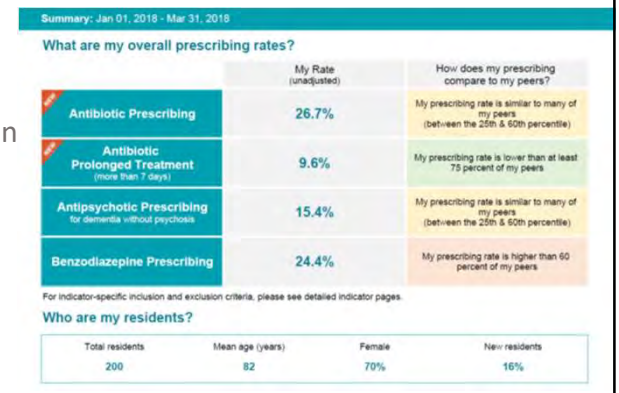
Peer Comparison Audit and Feedback in Nursing Homes can lead to reduced prolonged antibiotic durations

- Randomized controlled trial in Ontario in 2019 among 1,238 **providers in long-term care facilities**
  - 28% of physicians **received audit and feedback**
- **Audit and feedback** was associated with:
  - a significant decline in prolonged antibiotics
    - 335,912 fewer days of treatment
  - No significant difference in antibiotic initiation



Daneman N, et al. *Clin Infect Dis*. 2021;73(6):e1296-e1304.

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Action & Education

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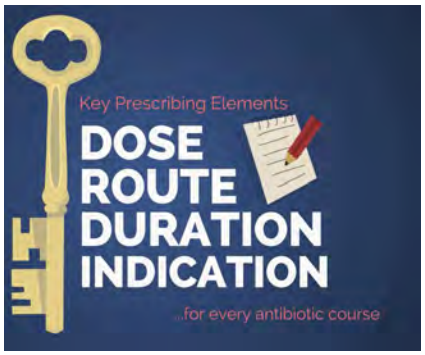
Implementing Antibiotic Use Protocols and Improving Documentation

- Evaluation, communication and documentation of changes in clinical condition and suspected infection.
- Antibiotic use protocols that incorporate Treatment guidance for common infections based on practice guidelines.



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Improving Microbiology Testing Practices

- Develop algorithms for appropriate diagnostic testing and best practices for microbiology testing.
  - Avoiding "test of cure" for urinary tract or *C. difficile* infection
  - Avoiding testing on admission when asymptomatic
  - Avoiding testing for asymptomatic bacteriuria in the absence of symptoms

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Opportunity: Diagnosis, Treatment and Prophylaxis Urinary Tract Infections.

- Asymptomatic bacteriuria is common in nursing home residents.
  - Urine cultures are positive in 25-50% of women and 15-35% of men in nursing homes.
  - Up to 1/2 of antibiotics prescribed to treat UTI in older adults are inappropriate.
  - Foul-smelling or cloudy urine frequently leads to unnecessary urine testing.
- Overtesting leads to overdiagnosis of UTI, treatment of asymptomatic bacteriuria, risk for adverse drug events, and delays in diagnosis.
- There is limited evidence to support prophylaxis for UTI in nursing home residents.

1. Nicolle et al. Int J Antimicrob Agents. 2006 Aug;28 Suppl 1:S42-8. 2. Nicolle et al. Infect Control Hosp Epidemiol. 2001 Mar;22(3):167-75.
3. Nicolle et al, Clin Infect Dis. 2005;40(5):643-654. 4. Crnich et al, J Am Geriatr Soc. 2017 Aug;65(8):1661-1663.
5. Trautner. Nat Rev Urol. 2012;9(2):85-93. 6. Nicolle et al, Infect Dis Clin North Am. 1997; 11(3):647-662.
7. Eure et al, Infect Control Hosp Epidemiol 2017 Aug;38(8):998-1001. 8. Wald. JAMA Intern Med. 2016 May 1;176(5):587-8.
9. Ahmed." BMJ Open. 2017 May 29;7(5):e015233.

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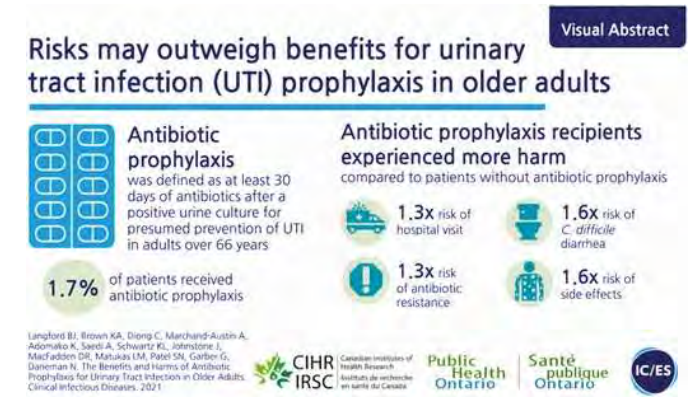
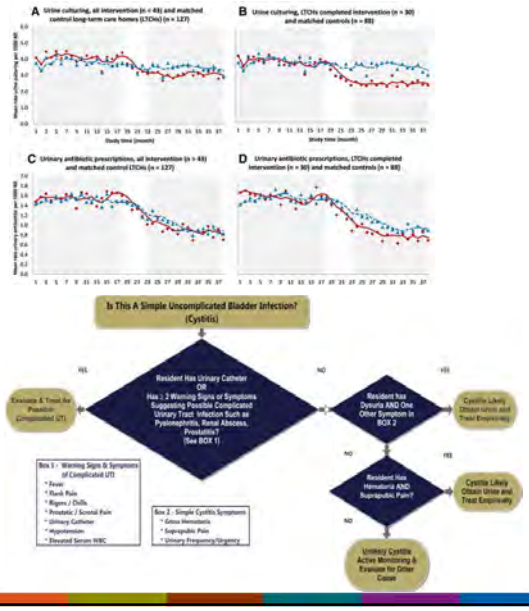
Improving Diagnosis of Urinary Tract Infections





Chambers et al. BMJ Qual Saf 2022 Feb;31(2):94-104.
Nace et al. J Am Med Dir Assoc. 2018 Sep;19(9):765-769.e3.
Ashraf et al. J Am Med Dir Assoc. 2020 Jan;21(1):12-24.e2.

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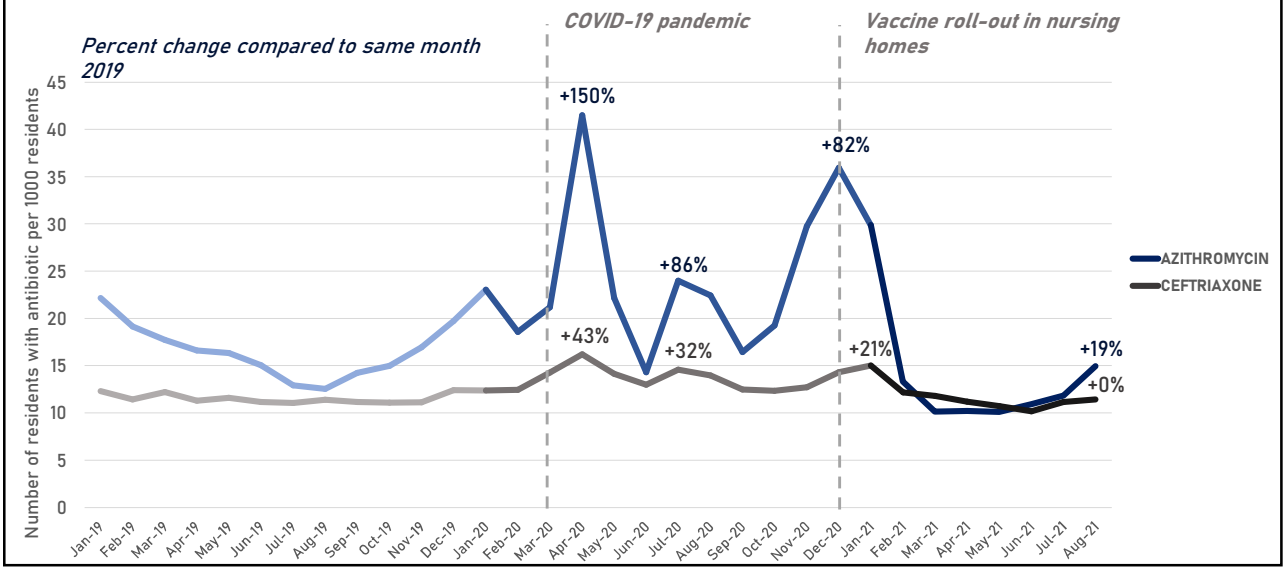
Prescribing antibiotics for respiratory infections



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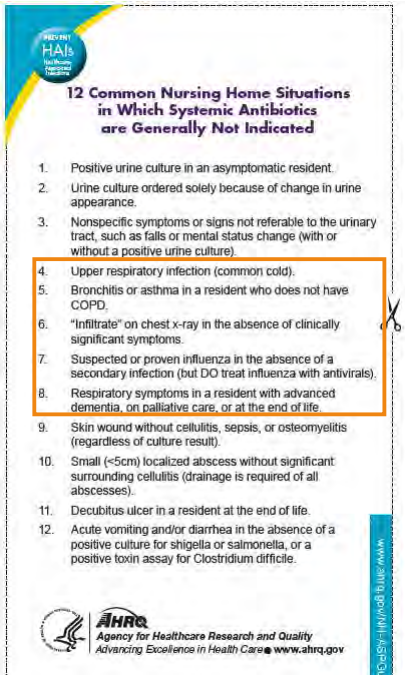
Opportunities for Improvement
When not to treat



12 Common Nursing Home Situations in Which Systemic Antibiotics are Generally Not Indicated

1. Positive urine culture in an asymptomatic resident.
2. Urine culture ordered solely because of change in urine appearance.
3. Nonspecific symptoms or signs not referable to the urinary tract, such as falls or mental status change (with or without a positive urine culture).
4. Upper respiratory infection (common cold).
5. Bronchitis or asthma in a resident who does not have COPD.
6. "Infiltrate" on chest x-ray in the absence of clinically significant symptoms.
7. Suspected or proven influenza in the absence of a secondary infection (but DO treat influenza with antivirals).
8. Respiratory symptoms in a resident with advanced dementia, on palliative care, or at the end of life.
9. Skin wound without cellulitis, sepsis, or osteomyelitis (regardless of culture result).
10. Small (<5cm) localized abscess without significant surrounding cellulitis (drainage is required of all abscesses).
11. Decubitus ulcer in a resident at the end of life.
12. Acute vomiting and/or diarrhea in the absence of a positive culture for shigella or salmonella, or a positive toxin assay for Clostridium difficile.

AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care • www.ahrq.gov

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Antibiotic Review

- Antibiotic review or "Antibiotic time-out"
  - Reassessing treatment after antibiotic start based on clinical response and laboratory results to determine whether antibiotics are still needed, can be stopped or should be adjusted.

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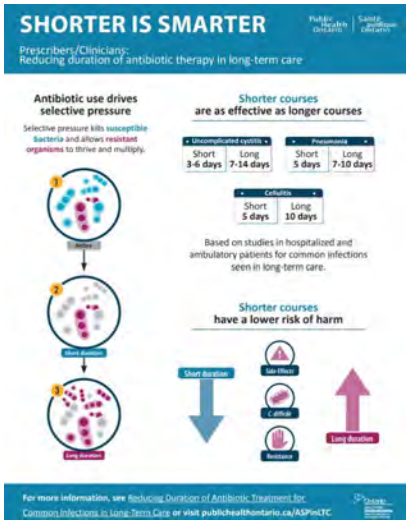
Antibiotic Review

- Antibiotic review or "Antibiotic time-out"
  - Reassessing treatment after antibiotic start based on clinical response and laboratory results to determine whether antibiotics are still needed, can be stopped or should be adjusted.
- Treatment for the minimum effective duration of residents who are stable with appropriate clinical response



https://www.publichealthontario.ca/-/media/Documents/F/2018/factsheet-duration-antibiotics-ltc-common-infections.pdf?sc_lang=en

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Antibiotic Use Protocols and Improving Communication.

No Infection	Infection

Supportive Care
Active monitoring
Diagnostic Tests
Antibiotic Stewardship

Integrating antibiotic stewardship into existing workflow

Improving documentation of critical information

Standardizing communication between front-line nursing staff and offsite prescribers
SBAR

https://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/toolkit1-suspected-uti-sbar.html

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Communication with Emergency Departments and Hospitals

- Standardized transfer forms can improve the communication of important information related to resident care when residents are transferred to other healthcare settings.
- There are critical gaps in communication between nursing homes, emergency departments, and acute care hospitals.
  - Antibiotic stewardship at hospital discharge is important.

Griffiths et al, Int J Nurs Stud. 2014 Nov;51(11):1517-23.
Dalawari et al, Geriatr Nurs. 2011 Jul-Aug;32(4):270-5.
Terrell et al, Acad Emerg Med. 2005 Feb;12(2):114-8.
https://www.cdc.gov/hai/pdfs/toolkits/InfectionControlTransferFormExample1.pdf
https://www.cdc.gov/antibiotic-use/pdfs/BAA-Hospital-Discharge-Flowchart-P.pdf

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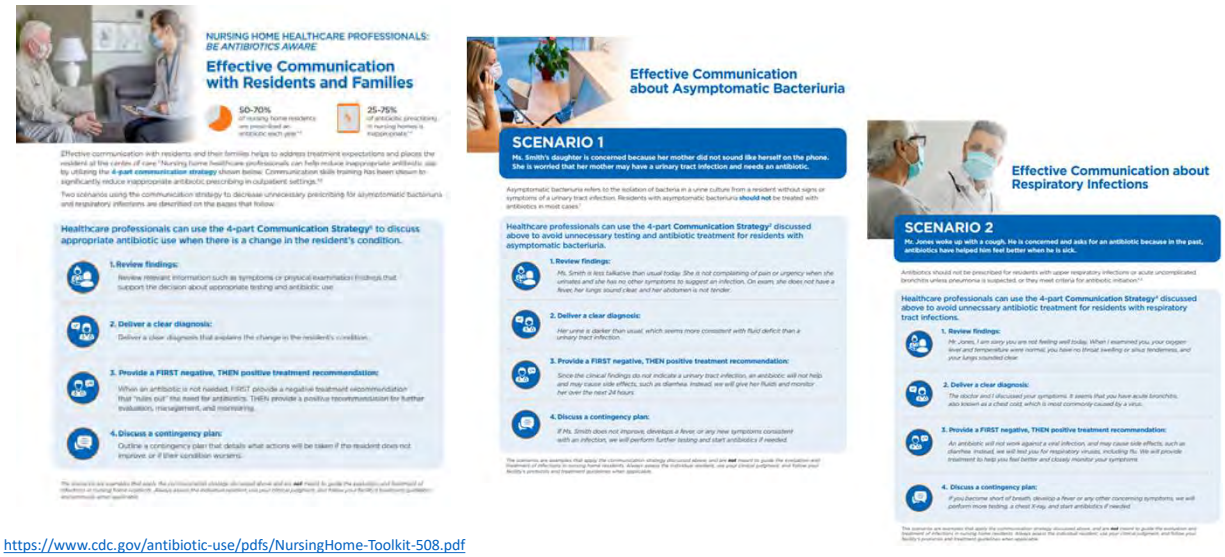
Improving Communication with Residents and Families.



https://www.cdc.gov/antibiotic-use/pdfs/NursingHome-Toolkit-508.pdf

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Antibiotic Stewardship

- Antibiotic stewardship implementation can help avoid delays in diagnosis and initiation of treatment of suspected infections.
- Integrate antibiotic stewardship in quality improvement initiatives that improve the evaluation, treatment and surveillance of infections
  - Improve screening and management of residents with suspected sepsis.

BE ANTIBIOTICS AWARE

GET AHEAD OF SEPSIS

40

Antibiotic stewardship implementation can improve antibiotic prescribing in nursing homes.

- Systematic reviews assessing antibiotic stewardship programs in nursing homes revealed the following:
  - Interventions are multifaceted
    - Most commonly implemented strategies were educational materials, educational meetings, and guideline implementation
  - Report a decrease in overall, indication-specific antibiotic prescribing or improved "guideline adherence" as an outcome
  - None reported a significant change in mortality or hospitalization.

Feldstein et al, J Am Med Dir Assoc. 2017 Aug 7.
McElligott et al, Infect Dis Clin North Am. 2017 Dec;31(4):619-638.
Wu et al. J Am Geriatr Soc. 2019 Feb;67(2):392-399.

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Antibiotic Stewardship Implementation

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Core Elements Checklist

Checklist for Core Elements of Antibiotic Stewardship in Nursing Homes

The following checklist is a companion to the Core Elements of Antibiotic Stewardship in Nursing Homes. The CDC recommends that all nursing homes take steps to implement antibiotic stewardship activities. Before getting started, use this checklist as a baseline assessment of policies and practices which are in place. Then use the checklist to review progress in expanding stewardship activities on a regular basis (e.g., annually). Over time, implement activities for each element in a step-wise fashion.

LEADERSHIP SUPPORT — ESTABLISHED AT FACILITY

1. Can your facility demonstrate leadership support for antibiotic stewardship through one or more of the following actions? ❑ Yes ❑ No

If yes, indicate which of the following are in place (select all that apply)
- ❑ Written statement of leadership support to improve antibiotic use
- ❑ Antibiotic stewardship duties included in medical director position description
- ❑ Antibiotic stewardship duties included in director of nursing position description
- ❑ Leadership monitors whether antibiotic stewardship policies are followed
- ❑ Antibiotic use and resistance data is reviewed in quality assurance meetings

ACCOUNTABILITY

2. Has your facility identified a lead(s) for antibiotic stewardship activities? ❑ Yes ❑ No

If yes, indicate who is accountable for stewardship activities (select all that apply)
- ❑ Medical director
- ❑ Director or assistant director of nursing services
- ❑ Consultant pharmacist
- ❑ Other: _____

DRUG EXPERTISE

3. Does your facility have access to individual(s) with antibiotic stewardship expertise? ❑ Yes ❑ No

If yes, indicate who is accountable for stewardship activities (select all that apply)
- ❑ Consultant pharmacy has staff trained/is experienced in antibiotic stewardship
- ❑ Partnering with stewardship team at referral hospital
- ❑ External infectious disease/stewardship consultant
- ❑ Other: _____

ACTIONS TO IMPROVE USE

4. Does your facility have policies to improve antibiotic prescribing/use? ❑ Yes ❑ No

If yes, indicate which policies are in place (select all that apply)
- ❑ Requires prescribers to document a dose, duration, and indication for all antibiotic prescriptions
- ❑ Developed facility-specific algorithm for assessing residents
- ❑ Developed facility-specific algorithms for appropriate diagnostic testing (e.g., obtaining cultures) for specific infections
- ❑ Developed facility-specific treatment recommendations for infections
- ❑ Reviews antibiotic agents listed on the medication formulary
- ❑ Other: _____

https://www.cdc.gov/antibiotic-use/core-elements/pdfs/core-elements-antibiotic-stewardship-checklist-508.pdf

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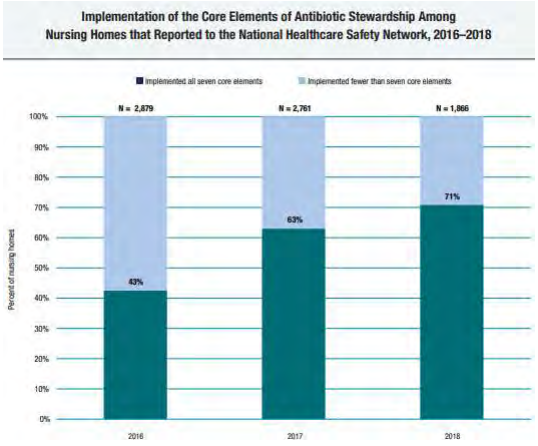
Nursing home antibiotic stewardship implementation

- Assessing implementation through the NHSN's LTCF annual survey



NHs that dedicated at least **20 hours** to **IPC** activities per week were **14%** more likely to implement all **seven core elements**.

Gouin et al, Infect Control Hosp Epidemiol. 2021 May 10;1-5

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Data Source: Certification and Survey Provider Enhanced Reporting (CASPER)

- Public database contains CMS deficiency citations issued by state surveyors during nursing home facility inspections.
- Assessing stewardship citations
- Citation text structure:

Facility information

Regulatory language explaining citation

Summary including resident examples and/or chronologic order of what transpired

Interviews with residents, staff, and administrators

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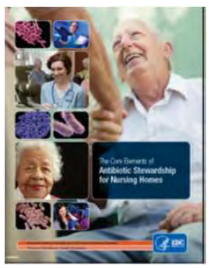
Antibiotic Stewardship Citations-Qualitative Analysis

Objective: Identify opportunities for improvement in nursing home antibiotic stewardship programs

Approach: Conduct qualitative review of a randomly selected subset (318/635) of citations and **categorize** into themes based on the **CDC Core Elements of Antibiotic Stewardship**

1. **Leadership & Accountability**
   - Antibiotic Stewardship roles and policy
2. **Action**
   - Antibiotic prescribing protocols and review
3. **Tracking & Reporting**
   - Antibiotic and infection logs and report-out
4. **Education**
   - Staff training



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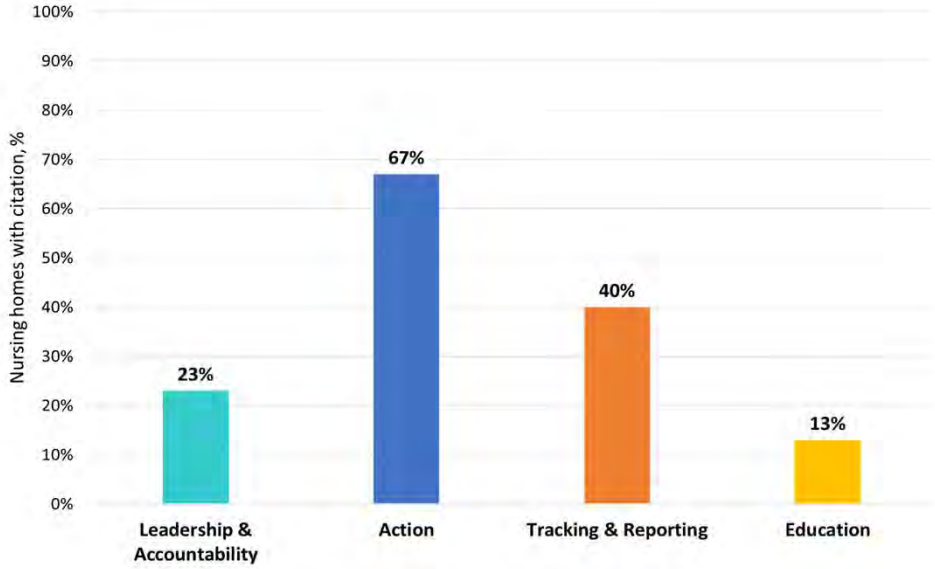
Action was most the most common deficiency cited in nursing homes among the 318 citations reviewed.



Note: These categories are not mutually exclusive; citations could be classified into one or more categories.

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Leadership & Accountability (23%)

Accountability

- No designated person/committee
- Staff turnover

Antibiotic Stewardship Policy

- Missing or not implemented
- Staff unaware

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Leadership & Accountability (23%)

"did not have one [Antibiotic Stewardship Program] currently…"

Antibiotic Stewardship Policy

- Missing or not implemented
- Staff unaware

41/72 (57%)

No stewardship policy available

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Action Related to Antibiotic Prescribing (67%)

Prescribing Protocols	Criteria for initiation	Reassessment	Review upon admission
▪ Missing or not implemented	▪ No documented indication ▪ Did not meet based on symptoms, diagnostics, and lab results	▪ Appropriate drug, dose, and duration ▪ Diagnostic test results	▪ No review of antibiotics prescribed during hospitalization or emergency department visit

50

Action Related to Antibiotic Prescribing (67%)

Prescribing Protocols

- Missing or not implemented
- Antibiotic initiation, reassessment, communication tools

"…did not include protocols on prescribing, documentation of the indication, dosage and duration of use of antibiotics."

51

Action Related to Antibiotic Prescribing (67%)

Criteria for initiation

- No documented indication
- Did not meet based on symptoms, diagnostics, and lab results

"… the physician order did not indicate the reason the antibiotic medication was being prescribed."

115/213 (54%)

missing or incomplete criteria documented for antibiotic initiation

52

Action Related to Antibiotic Prescribing (67%)

Reassessment

- Appropriate drug, dose, and duration
- Diagnostic test results

*"…did not have a **stop date** for the antibiotic."*

"…prescriber was not asked to change the order"

53

Action Related to Antibiotic Prescribing (67%)

Review upon admission

- No review of antibiotics prescribed during hospitalization or emergency department visit

"…the facility does not require surveillance to be done if the infection and antibiotic order occurred in the hospital."

54

Tracking & Reporting (40%)

Antibiotic/Infection Surveillance Log

- Missing or incomplete

Report-out

- Not reviewed with prescribers or at quality improvement meetings

55

Tracking & Reporting (40%)

Antibiotic/Infection Surveillance Log

- Missing or incomplete

***"Logs did not include enough information** to allow analysis of whether infections met criteria for treatment with ABXs prior to being treated or information about the **length of treatment**…"*

117/126 (93%)

missing or incomplete antibiotic or infection tracking logs

56

Education (13%)

Training for Healthcare Professionals

- Staff not trained on antibiotic use policies and protocols
- Frontline/nursing staff, infection preventionist, physicians, other

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Conclusions

1. **Opportunities for improvement**
   - **Ensure policy is available**
   - **Implement antibiotic use protocols**
     - Document criteria for antibiotic initiation
     - Document assessment and review of antibiotics
     - Integrated in nursing home workflows
   - **Education and staff training**
2. **Resources needed to support nursing homes**
   - **Antibiotic use reports for tracking and reporting**
     - Electronic health record, long-term care pharmacy, manual
     - Training resources
3. **Further evaluation to identify barriers to implementation**

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Resources

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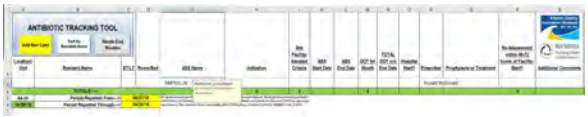
Resources

- **Core Elements of Antibiotic Stewardship for Nursing Homes**
  https://www.cdc.gov/antibiotic-use/core-elements/nursing-homes.html
- **Checklist for Core Elements of Antibiotic Stewardship for Nursing Homes**
  https://www.cdc.gov/antibiotic-use/core-elements/pdfs/core-elements-antibiotic-stewardship-checklist-508.pdf
- **Implementation Resources for Nursing Homes**
  https://www.cdc.gov/antibiotic-use/core-elements/nursing-homes/implementation.html
- **CDC Nursing Home Infection Preventionist Training Course**
  https://www.train.org/cdctrain/training_plan/3814
- **AHRQ Toolkit to Improve Antibiotic Use in Long-Term Care**
  https://www.ahrq.gov/antibiotic-use/long-term-care/index.html
- **Rochester Nursing Home Collaborative Antibiotic Tracking Sheet**
  https://www.rochesterpatientsafety.com/index.cfm?Page=For%20Nursing%20Homes
- **Template for an Antibiotic Stewardship Policy for Post-Acute and Long-Term Care Settings**
  https://pubmed.ncbi.nlm.nih.gov/28935515/
- **Resources from Quality Innovation Network-Quality Improvement Organizations (QIN-QIOs)**
  https://www.telligenqinqio.com/antibiotic-stewardship-long-term-care/
- **Infographics and Evidence Briefs from Public Health Ontario**
  https://www.publichealthontario.ca/en/health-topics/antimicrobial-stewardship/long-term-care



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U.S. ANTIBIOTIC AWARENESS WEEK
November 18–24, 2022
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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.

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