STEWARDSHIP: LONG TERM CARE EDITION

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Disclosures

Scientific Advisory Board: HealthTrackRx

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What is Stewardship?

Antimicrobial stewardship is the effort to measure and improve how antibiotics are prescribed by clinicians and used by patients.

US Centers for Disease Control and Prevention. https://www.cdc.gov/antibiotic-use/core-elements/index.html#print 3

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Why Stewardship?

1.27 million deaths annually attributable to antimicrobial resistance (AMR), and nearly 5 million associated with resistant infections

Top 10 Global Health Threat

World Health Organization (WHO)

Source: https://www.cdc.gov/antibiotic-use/images/AR-Burden-Numbers-2019.png
Lancet 2022;399:629-55.
EClinicalMedicine 2021;41:101221 4

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AMR Impacts More Than Human Health…

CDCs 2019 AR Threats Report, https://www.cdc.gov/antimicrobial-resistance/data-research/threats/?CDC_AAref_Val=https://www.cdc.gov/drugresistance/biggest-threats.html 5

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Stewardship - Part of a Larger Plan…

2015 WHO Action Plan

- To improve awareness and understanding of AR through effective communication, education and training
- To strengthen the knowledge and evidence base through surveillance and research
- To reduce the incidence of infection through sanitation, hygiene and infection prevention measures
- To optimize the use of antimicrobial medicines in human and animal health
- To develop the economic case for sustainable investment that takes account of the needs of all countries and to increase investment in new medicines, diagnostic tools, vaccines and other interventions

https://www.who.int/publications/i/item/9789241509763 6

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U.S. National Efforts – 5 Goals

- Goal 1. Slow the emergence of resistant bacteria and prevent the spread of resistant infections
- Goal 2. Strengthen national One Health surveillance efforts to combat resistance
- Goal 3. Advance development and use of rapid and innovative diagnostic tests for identification and characterization of resistant bacteria

Goal 4. Accelerate basic and applied research and development for new antibiotics, other therapeutics and vaccines

Goal 5. Improve international collaboration and capacities for antibiotic-resistance prevention, surveillance, control and antibiotic research and development

https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//196436/CARB-National-Action-Plan-2020-2025.pdf 7

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Antibiotic Overuse is Common In Nursing Homes

75% of nursing home residents receive an antibiotic if stay > 6 months

> 50% of antibiotic prescriptions in nursing homes are unnecessary

If needed, the antibiotic prescribed is often too broad in spectrum and/or the course is longer than needed

J Am Med Dir Assoc 2012;13:568.e1-13.
Infect Dis Clin N Am 2017;31:619-38.

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U.S. Nursing Home Stewardship Regulatory Timeline

- July 2015- CMS adds stewardship to COP* for nursing homes
- May 2019- Delayed since 11/2017, long term care facility surveys for stewardship begin
- April 2020- Nursing homes required to report COVID-19 data into NHSN

* COP= condition of participation

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Conditions of Participation

What exactly is required?

- have an ASP that includes antibiotic use protocols and a system to monitor antibiotic use
- Needs to be included in the Infection Control program

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Medicare & Medicaid Services

42 CFR Parts 405, 431, 447, 482, 483, 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

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There are Many Resources Available

https://www.cdc.gov/antibiotic-use/core-elements/index.html 11

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CDC Core Elements- Nursing Homes

https://www.cdc.gov/antibiotic-use/core-elements/index.html 12

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Leadership Commitment

Demonstrate support and commitment to safe and appropriate antibiotic use in your facility.

Priority examples (select):

- Write statements of support
- Include stewardship-related duties in job descriptions
- Communicate the priority with nursing and prescribers
- Create a culture through messaging, education and celebrating improvement

https://www.cdc.gov/antibiotic-use/core-elements/pdfs/core-elements-antibiotic-stewardship-H.pdf 13

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Additional Resources

Nursing Home Antimicrobial Stewardship Guide

AHRQ Agency for Healthcare Research and Quality

Overview of the Guide
The Nursing Home Antimicrobial Stewardship Guide provides toolkits to help nursing homes optimize their use of antibiotics.

Browse Antimicrobial Stewardship Toolkits
Toolkits on four topic areas are available.

Implement, Monitor, and Sustain a Program
Two toolkits help nursing homes start and maintain antimicrobial stewardship programs.

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https://www.ahrq.gov/nhguide/index.html 14

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Leadership Commitment Resources

Sample Letters of support

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Assessing Nursing Home Stewardship

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	

https://www.cdc.gov/antibiotic-use/core-elements/pdfs/core-elements-antibiotic-stewardship-checklist-508.pdf 16

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Accountability

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

Key points:

- Empower the medical director
- Empower the director of nursing
- Engage the consultant pharmacist
- Partner with infection prevention program coordinator, referral lab, department of health

https://www.cdc.gov/antibiotic-use/core-elements/pdfs/core-elements-antibiotic-stewardship-H.pdf 17

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Accountability Resources

3. **Appoint two champions to promote the importance of an antimicrobial stewardship program in the nursing home**. These individuals should lead the effort and be responsible for program outcomes. Two champions are recommended to increase the chance that the antimicrobial stewardship program always has a leader through periods of staff change. These champions should have the following qualities:
   a. A basic knowledge of antibiotics
   b. An interest in playing a leadership role in the nursing home
   c. The respect of his or her peers
   d. An understanding of how to be a good team player
   e. An understanding of the importance of improving antibiotic use in nursing homes

https://www.cdc.gov/antibiotic-use/core-elements/pdfs/core-elements-antibiotic-stewardship-H.pdf 18

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Drug Expertise

Establish access to consultant pharmacists or other individuals with experience or training in antibiotic stewardship for your facility.

Priority areas:

- Work with consultant pharmacists
- Partner with local antibiotic stewardship program leads
- Develop relationships with infectious diseases consultants

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

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Action

Implement at least one policy or practice to improve antibiotic use.

Priority examples (select):

- Policies that support optimal antibiotic use
- Broad interventions to improve antibiotic use
- Pharmacy-based interventions interventions to improve antibiotic use
- Infection and syndrome specific interventions to improve antibiotic use

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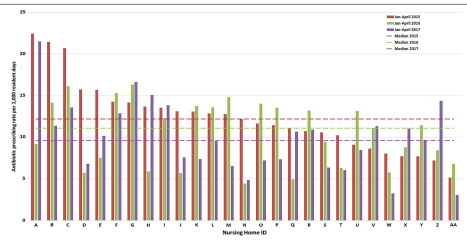
Action in Action



Sloane PD et al. *JAGS* 2020;68:46-54.

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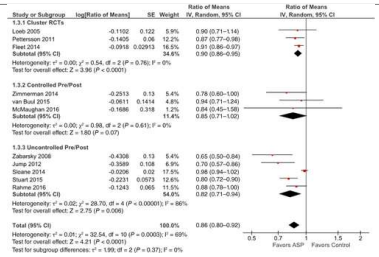
Action in Action



Wu JH et al *J Am Geriatr Soc* 2019;67:392-99

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Action Resources

Toolkit 1. Start an Antimicrobial Stewardship Program

Tool 5. Draft Policies and Procedures for the Antimicrobial Stewardship Program

Determine Whether It Is Necessary To Treat a Potential Infection With Antibiotics

- Minimum Criteria for Antibiotics Tool
- Toolkit 1. Suspected UTI SBAR Toolkit
- Toolkit 2. Common Suspected Infections: Communication
- Toolkit 3. Minimum Criteria for Three Infections Toolkit

https://www.ahrq.gov/nhguide/toolkits/implement-monitor-sustain-program/toolkit 1-start-program.html

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Action Resources

SPICE

HOME ABOUT FACILITY TYPE COURSES BROWSE ALL RESOURCES

NC CLASP: ANTIBIOTIC STEWARDSHIP RESOURCES FOR NURSING HOME

Minnesota Antimicrobial Stewardship Program Resources for Long-term Care Facilities

https://www.rochesterpatientsafety.com/index.cfm?Page=For%20Nursing%20Homes

https://spice.unc.edu/all-resources/?fwp_resource_topics_dropdown=clasp

https://www.health.state.mn.us/diseases/antibioticresistance/hcp/asp/tcdindex.html

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Tracking & Reporting

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

Provide regular feedback on antibiotic use and resistance to prescribing clinicians, nursing staff and other relevant clinical staff.

Priority examples (select):

- Process measures: How and why antibiotics are prescribed
- Antibiotic use measures: How often and how antibiotics are prescribed
- Antibiotic use outcome measures: Tracking the adverse outcomes and costs from antibiotics

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Measuring Antimicrobial Use

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Financial Data

Target audience: Administrators

- Most common measure of antibiotic use
- Must choose between purchases vs. billing data

Pros:

- Easily available data
- Often tied to institutional goals for stewardship programs
- Likely to be a "win" given historical effect of stewardship on this measure

Cons/Limitations:

- Must remember to consider changes in contract pricing
- Non-administrators less likely to be influenced by results

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dason DUKE ANTIMICROBIAL STEWARDSHIP OUTREACH NETWORK

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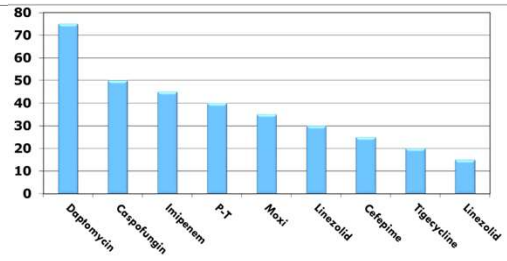
Top 10 Antibiotics: By Cost



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Defined Daily Dose

Target Audience: Administrators and Epidemiologists

- Standardized definition of daily antibiotic dose
- Created by the World Health Organization
- Correction factor: Total Units (i.e. mg) Drug / DDD Correction Factor

Pros:

- Attempts to convert raw purchasing data into utilization data
- Allows comparisons with other institutions
- Easy to calculate

Cons:

- Not everyone agrees with the DDD correction factors
- Many use institution-specific correction factors (prescribed daily dose)
- Not patient level information

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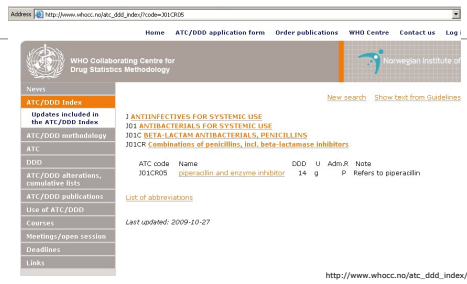

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dason DUKE ANTIMICROBIAL STEWARDSHIP OUTREACH NETWORK

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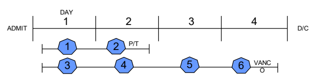
Are Additional Metrics Available?

Number of antibiotic days
- Note: this is not the same as Days of Therapy



- DOT:
  - Piperacillin/tazobactam= 2
  - Vancomycin = 4
- Antibiotic days:
  - Overall = 4

Polk et al. CID 2011;53(11):1100–10

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Data Example

DRUG NAME	SIG			DATE WRITTEN	QTY AUTH	QTY DISP
DOXYCYCLINE 100 MG CAPSULE	TAKE ONE CAPSULE PO TWICE	DAILY X 7 DAYS	(BRONCHITIS/COPD)	27-Jan-16	14	14
CIPROFLOXACIN 500MG TABS(*)	ONE TABLET PO TWICE	DAILY. (OSTEOMYELITIS)	(DC 2/8/16)	4-Jan-16	70	55
VANCOMYCIN 1 GM ADD-VAN VIA	INFUSE 1GM I.V. EVERY 12	HOURS OVER 60-90 MINUTES	(*Activate before use*)	12-Jan-16	60	8
VANCOMYCIN 1 GM ADD-VAN VIA	INFUSE 1GM I.V. EVERY 12	HOURS OVER 60-90 MINUTES	(*Activate before use*)	25-Jan-16	28	8
SULFAMETHOXAZOLE/TMP DS TAB	TAKE 1 TABLET BY MOUTH	TWICE DAILY X 14 DAYS.	(PYELONEPHRITIS)	11-Jan-16	28	2
CEFPODOXIME 200 MG TABLET	TAKE ONE TABLET PO EVERY	12 HOURS FOR 10 DAYS	(PYELONEPHRITIS)	12-Jan-16	20	5

Calculations:
Doxycycline: 7 DOT
Ciprofloxacin: 55/2= 27.5- 28 DOT
Vancomycin: 8/2= 4 DOT

DRUG NAME	SIG			DATE WRITTEN	QTY AUTH	QTY DISP	DOT
DOXYCYCLINE 100 MG CAPSULE	TAKE ONE CAPSULE PO TWICE	DAILY X 7 DAYS	(BRONCHITIS/COPD)	27-Jan-16	14	14	7
CIPROFLOXACIN 500MG TABS(*)	ONE TABLET PO TWICE	DAILY. (OSTEOMYELITIS)	(DC 2/8/16)	4-Jan-16	70	55	28
VANCOMYCIN 1 GM ADD-VAN VIA	INFUSE 1GM I.V. EVERY 12	HOURS OVER 60-90 MINUTES	(*Activate before use*)	12-Jan-16	60	8	4
VANCOMYCIN 1 GM ADD-VAN VIA	INFUSE 1GM I.V. EVERY 12	HOURS OVER 60-90 MINUTES	(*Activate before use*)	25-Jan-16	28	8	4
SULFAMETHOXAZOLE/TMP DS TAB	TAKE 1 TABLET BY MOUTH	TWICE DAILY X 14 DAYS.	(PYELONEPHRITIS)	11-Jan-16	28	2	1
CEFPODOXIME 200 MG TABLET	TAKE ONE TABLET PO EVERY	12 HOURS FOR 10 DAYS	(PYELONEPHRITIS)	12-Jan-16	20	5	3

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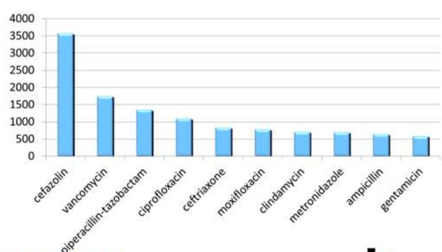
Top 10 Antibiotics: By Number of Patients Treated



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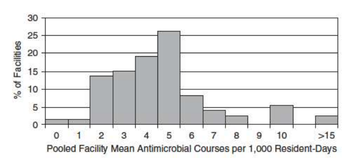
New Starts

Courses/starts per 1,000 resident days



- Advantages: easier to measure
- Disadvantages: does not tell the whole picture- what about durations and overall exposure
  - Remember- a single course of chronic UTI prophylaxis is only started once!!!

Benoit SR et al. *JAGS* 2008;56:2039-44.

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Proportion of Residents Receiving Antibiotics

Number (or percentage) of patients receiving antimicrobials

Advantages:
This number can help target education.

Disadvantages:
This can still underestimate key prescribing practices.

Table 2. Comparison of antibiotic use and cost indicators by physician, February 1999-September 2001*

Physician code	Incidence	AUR	Cost/RCD	Cost/ Ab-day
A	3.7 ± 1.3	3.7 ± 1.6	\$0.18 ± 0.11	\$5.49 ± 2.50
B	4.9 ± 1.4	4.7 ± 1.3	\$0.25 ± 0.12	\$5.35 ± 1.83
C	4.6 ± 2.7	4.2 ± 2.2	\$0.30 ± 0.20	\$7.43 ± 4.52
D	6.5 ± 2.4	6.5 ± 2.5	\$0.39 ± 0.19	\$5.87 ± 1.72
E	5.5 ± 1.4	4.7 ± 1.3	\$0.25 ± 0.12	\$5.31 ± 1.74
F1	4.1 ± 2.1	3.3 ± 1.9	\$0.19 ± 0.12	\$6.01 ± 3.37
F2	6.1 ± 1.9	5.5 ± 2.1	\$0.27 ± 0.17	\$5.00 ± 1.93
P value	<.001	<.001	<.001	.08

RCD, Resident care-days; *Ab*, antibiotic; *AUR*, antimicrobial utilization ratio; *Cost/RCD* = Total cost for antibiotics per month/total resident care-days per month; *cost per A Day* = Total cost for antibiotics per month/total antibiotic-days per month; *incidence* = Number of antibiotic courses started per 1000 resident care-days per month; *AUR* = Number of antibiotic days per month/number of resident care-days per month multiplied by 100 (%).
*Values are mean ± standard deviation per month for 32-month study period.

Myelotte JM and Neff M. *AJIC* 2003;18-25.

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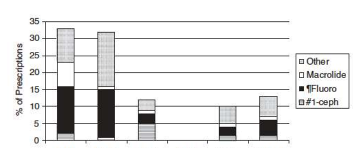
Understanding Why Antibiotics are Used



Benoit SR et al. *JAGS* 2008;56:2039-44.

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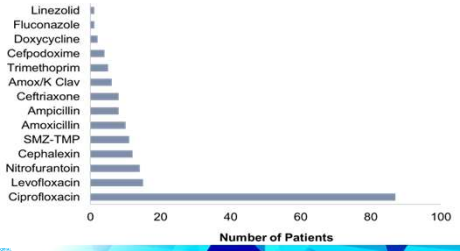
Most Common Agents Used for UTI



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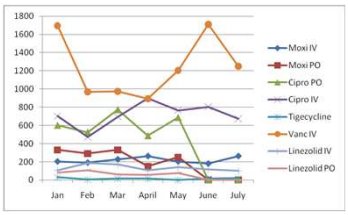
Time Trends More Useful



University of Rochester Medical Center

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Getting to the bottom of the problem….

Measures of antibiotic use are difficult to interpret and compared when examined alone

DDD
DOT
Cost

Numerator Values

A denominator is needed to standardize measurement of antibiotic use!

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Available Denominators for Measuring Antibiotic Use

Admissions:
- CDC Definition: The aggregate number of patients admitted to the facility starting on the first day of each month through the end of the calendar month

Patient Days:
- CDC Definition: A daily count of the number of patients in the patient care location during a time period. To calculate patient days, for each day of the month, at the same time each day, record the number of patients.

Days Present:
- CDC Definition: number of patients present in a given location for any portion of any day

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Sources for Antibiotic Data in Nursing Homes

Purchasing data
- -Can be difficult for dispensing from a central pharmacy location to many facilities

Dispensing data
- Can be difficult with a lot of floor stock

Electronic MAR

Paper and pencil ☺
- Point prevalence survey

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There is no substitute for chart review (in some cases)…

Measures of antibiotic use

Point prevalence of antibiotic use. Point prevalence surveys of antibiotic use track the proportion of residents receiving antibiotics during a given time period (i.e., a single-day, a week, or a month). Because the data collection is time-limited, point prevalence surveys are an easier way to capture antibiotic use data. In addition to providing a snap-shot of the burden of antibiotic use in a facility, point-prevalence surveys can capture specific information about the residents receiving antibiotics and indications for antibiotic therapy.[1] Unlike other antibiotic use measures which focus only on the prescriptions initiated in the nursing home, prevalence surveys could also include data on residents admitted to the facility already receiving an antibiotic to track the total burden of individuals at risk for complications from antibiotic use (e.g., *C. difficile* infection).

CDC. Core Elements of Antibiotic Stewardship in Nursing Homes- Appendix B 2015.

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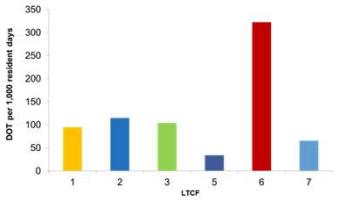
Large Variation in Antibiotic Use by LTCF



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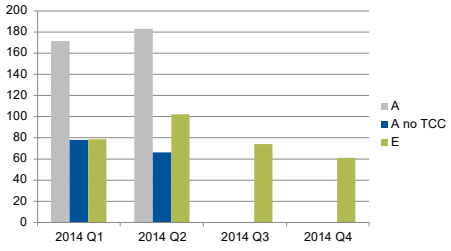
Location Specific Data are Important



Based on Dispensing Data

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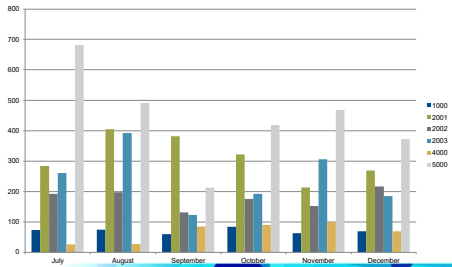
Time Trends Also Help



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Do we know our target?

Less is better:

Table 3. Antibiotic-Related Adverse Outcomes Among Residents Living in Nursing Homes With Low, Medium, and High Antibiotic Use*

Characteristic	Antibiotic Use, No. (%)		
	Low (n = 33 822)	Medium (n = 31 425)	High (n = 24 943)
Clostridium difficile	274 (0.8)	268 (0.9)	221 (0.9)
Diarrhea or gastroenteritis	3347 (9.9)	3388 (10.8)	2889 (11.6)
Infection with antibiotic-resistant organism	412 (1.2)	431 (1.4)	319 (1.3)
Antibiotic allergy	13 (0.0)	25 (0.1)	22 (0.1)
General adverse event from medication	96 (0.3)	124 (0.4)	88 (0.4)
Any antibiotic complication with or without potential for indirect harms to nonrecipients (primary composite outcome†)	3869 (11.4)	3890 (12.4)	3311 (13.3)
Only antibiotic complications with potential for indirect harms to nonrecipients (secondary composite outcome†)	3797 (11.2)	3801 (12.1)	3237 (13.0)

Daneman N et al. *JAMA Internal Medicine* 2015;175:1331-9.

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Making the Data Actionable

Data alone will not answer all the questions, but is allows more refined reviews

- Who?- Who is writing for the antibiotics?
- What?- What is the most frequently used antibiotic?
- Where?- Are there units that tend to use the most antibiotics?
- When?- Are there times when antibiotics are most likely to be prescribed?
- Why? - What is the most common reason antibiotics are used?

From there

- Conversations become more productive
- Guidelines for use can be created with provider input
- Remember- always ask why- the reasons behind the use might not be what you had guessed!

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Tracking & Reporting Resources

- **Tool options for monitoring**
  - **Antibiotic Use Tracking Sheet** (tool 2) (PDF | Word | Excel)
  - **Sample Monthly Summary Reports** to review progress (tool 3) (PDF | Word | Excel)
  - **Quarterly or Monthly Prescribing Profile** to report findings back to prescribing clinicians (tool 4) (PDF | Word)

AHRQ Agency for Healthcare Research and Quality

https://www.ahrq.gov/nhguide/toolkits/implement-monitor-sustain-program/toolkit2-monitor-sustain-program.html

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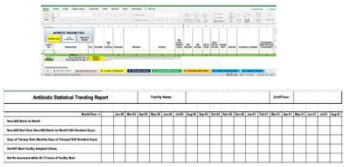
Tracking & Reporting Resources

ROCHESTER Nursing Home Collaborative



https://www.rochesterpatientsafety.com/index.cfm?Page=For%20Nursing%20Homes

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Education

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

Priority examples (select):

- Education to prescribers
- Education to nursing
- Education to residents and families

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Education Resources

https://learningforquality.org/login/?redirect=%2F

https://www.ahrq.gov/nhguide/toolkits/implement-monitor-sustain-program/index.html

https://www.rochesterpatientsafety.com/index.cfm?Page=For%20Nursing%20Homes

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