



Mississippi Morbidity Report

Appropriate Use of Antibiotics in the Outpatient Setting

Key Messages

- Inappropriate antibiotic use is a public health crisis accounting for an estimated 2 million antibiotic-resistant illnesses, 23,000 deaths and \$30 billion dollars in healthcare expenditures each year.
- Antibiotic resistance is primarily driven by **overuse** and **inappropriate use** by prescribing physicians.
- Inappropriate antibiotic use includes:
 - Prescribing an antibiotic when not indicated
 - Choosing the wrong antibiotic
 - Prescribing it for the wrong duration
 - Prescribing it via the wrong route of administration
- Most antibiotic courses are prescribed in the outpatient setting thus it is important to address the problem in this venue.
- Antibiotics are **never** or **rarely** needed for the following conditions:
 - Viral URIs/Common Cold
 - Acute Bronchitis
 - Pharyngitis (unless strep +)
 - In addition, "watchful waiting" is recommended for most cases of Otitis Media.
- The steps to becoming a good antibiotic steward include:
 - Commitment
 - Action
 - Tracking and reporting, and
 - Education and expertise

Background: Antibiotic resistance and prescribing - Why does it matter?

Inappropriate antibiotic prescribing is an important contributor to the development of resistant organisms. Antibiotic prescribing peaked in the mid 1990's yet reducing inappropriate antibiotic use remains a public health concern today. Misuse of antibiotics is estimated to account for 2 million antibiotic-resistant illnesses and 23,000 deaths each year in the United States with a cost of approximately 30 billion dollars.

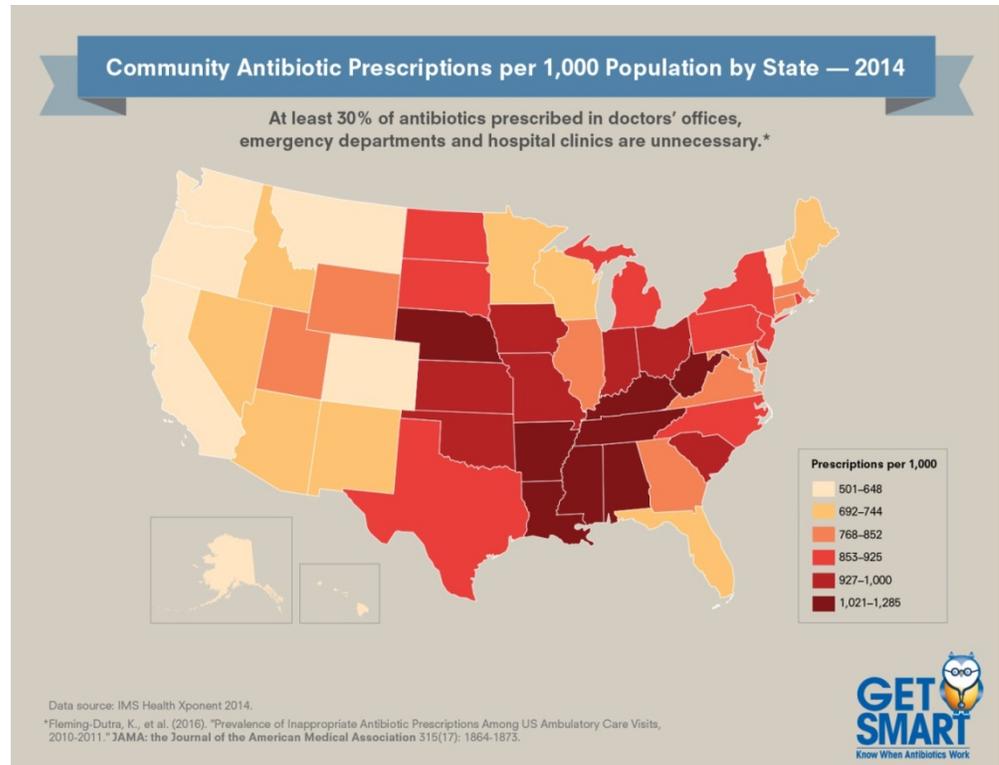
The Centers for Disease Control and Prevention (CDC) has identified three organisms as urgent threats. These are *C. difficile*, Carbapenem-resistant Enterobacteriaceae (CRE) and drug-resistant *Neisseria gonorrhoeae*. Twelve additional conditions were identified as serious threats including Vancomycin-resistant *Enterococcus* (VRE), Methicillin-resistant *Staphylococcus aureus* (MRSA), drug-resistant *Streptococcus pneumoniae* and tuberculosis. You can learn more about these threats at the following link: https://www.cdc.gov/drugresistance/biggest_threats.html. Infections with these organisms are serious leading to unnecessary and/or prolonged hospitalizations, additional courses of antibiotics, and can be life threatening.

Efforts to reduce inappropriate antibiotic use have traditionally focused on facilities such as acute care hospitals and long-term care facilities. However, since the majority of antibiotics are prescribed in the outpatient setting it is critical to address the issue in this venue. The CDC has estimated that 80 – 90% of all antibiotics are prescribed in the outpatient setting and up to 50 % of these prescriptions are unnecessary. Of

note, southern states, including Mississippi, have some of the highest rates of antibiotic prescribing in the US (See Figure).

Figure

Adverse drug events are another negative impact of unnecessary antibiotics. Up to 25% of patients receiving an antibiotic experience an adverse drug event which may be mild such as diarrhea, stomach upset or rash, more serious such as secondary infections with yeast or *C. difficile*, or life-threatening as with an anaphylactic reaction. Currently, 500,000 cases of *C. difficile* occur each year resulting in 29,300 deaths and \$1 billion in excess cost.



Various efforts have been undertaken to improve antibiotic prescribing practices in the United States. These include the publication of clinical practice guidelines outlining appropriate use of antibiotics for various infections including UTIs, acute otitis media, sinusitis, pharyngitis and bronchitis. Many medical specialty societies have also participated in the Choosing Wisely Campaign which is a broad-based intervention to educate the public and providers on the appropriate use of various medical interventions. A number of these recommendations are related to appropriate antibiotic use. More information on this initiative can be found at <http://www.choosingwisely.org/>. The Get Smart initiative is an effort of the CDC to promote the appropriate use of antibiotics and it has educational materials for both providers and patients. More on this initiative can be found at their website <https://www.cdc.gov/getsmart/community/index.html>.

The Healthcare Effectiveness Data and Information Set (HEDIS) measures are designed to evaluate the effectiveness of health care plans and their providers in providing appropriate care. Currently, three of the HEDIS measures relate to appropriate antibiotics prescribing. They include:

1. Appropriate testing of children with pharyngitis (for strep);
2. Appropriate treatment of children with upper respiratory infections (goal is that none will receive antibiotics for this diagnosis); and
3. Avoidance of the use of antibiotics for adults with acute bronchitis.

Despite these efforts, rates of antibiotic prescribing remain high. A recent study found that antibiotics were prescribed in 12.6% of all outpatient visits resulting in an annual rate of 506 antibiotic prescriptions per 1000 US population. That rate was even higher in the South (553/1000). Evaluation of visit diagnoses compared to evidence-based prescribing guidelines showed that overall 30% of courses were unnecessary. The rate rose to approximately 50 % when care for acute respiratory conditions (i.e. sinusitis, suppurative and non-suppurative otitis media, pharyngitis, viral URTI, bronchitis, bronchiolitis, influenza, and viral and nonviral pneumonia) were analyzed.

Inappropriate Antibiotic Prescribing – What does it look like?

Inappropriate antibiotic use includes using the wrong antibiotic, at the wrong time, for the wrong duration and/or by the wrong route of administration. This last element is more relevant to the inpatient setting and so will not be addressed further.

The Wrong Time

Antibiotics are frequently prescribed for viral illnesses. Upper respiratory tracts illnesses (URIs) or the common cold account for 37 million office visits per year. Thirty percent of these visits result in an antibiotic prescription at a cost of \$40 million dollars. The percentage is even higher for children with URIs (38%). Only 2% of cases of sinusitis/rhinosinusitis are caused by bacteria, however, 80% of these visits (4.3 million annually for adults) result in antibiotics being prescribed. Pharyngitis is also most commonly viral but greater than 60% of these patients receive antibiotics. Similarly, greater than 70% of adults with bronchitis receive antibiotics despite the fact that bronchitis is nearly always viral in origin. While antibiotics may be necessary for patients with acute otitis media, current guidelines endorse the practice of “watchful waiting” for those without severe symptoms and only initiating antibiotics if symptoms fail to improve.

The Wrong Antibiotic or the Wrong Duration

The use of broad spectrum antibiotics when not indicated is common. Examples include the use of fluoroquinolones for uncomplicated UTIs or azithromycin for respiratory illnesses. Broad spectrum antibiotics are prescribed 61% of the time when guidelines indicate a narrow spectrum agent is preferred. Lack of adherence to prescribing guidelines for community acquired pneumonia remains a problem. A recent outpatient study found that the preferred antibiotic, amoxicillin, was prescribed only 40.7% of the time and that broad spectrum antibiotics were used 59.3% of the time. The most common broad spectrum antibiotic prescribed was a macrolide which was prescribed in 42.5% of cases. Other broad-spectrum antibiotics were utilized in 16.8% of cases. Clinical factors did not typically explain this variation. In addition, antibiotics are often prescribed for longer periods of time than needed. Historically, UTIs have been treated with a 10 day course of antibiotics, but studies have shown and current guidelines support the efficacy of shorter courses of therapy (3 – 5 days).

Barriers to Appropriate Prescribing: What if I don’t treat?

Many providers believe that failure to provide a patient with antibiotics during an acute illness visit will result in decreased patient satisfaction. Studies evaluating this question have been mixed. One study performed among general practitioners in the United Kingdom found a modest but statistically significant negative effect on patient satisfaction scores. Another found that the quality of the communication during a visit was more important to patient satisfaction than whether or not an antibiotic was provided. A number of studies have shown that any negative effect can be offset by simple office-based interventions. These include:

1. Brief education of patients on why antibiotics are not needed and were not prescribed.
2. Discussion of steps to help alleviate symptoms including the provision of written prescriptions for symptomatic relief.
3. Discussion of precautions for return if symptoms do not improve or worsen (i.e. a contingency or follow-up plan).

Of note, it has also been shown that provider’s overestimate the number of patients who expect to receive antibiotics.

A recent report by the World Health Organization (WHO) highlights the need for patients to be educated on antibiotics and antibiotic resistance. Their study found that the general population was not aware of the

problem of antibiotic resistance and had many misconceptions regarding the appropriate use of antibiotics. Many believed that antibiotics could treat viral illnesses and that people, not bacteria, could become resistant to antibiotics. They generally did not understand the importance of using antibiotics exactly as prescribed or that they should not share antibiotics with others.

There are steps that a provider should take when not prescribing antibiotics as noted in the list of proven interventions above. This approach will address the patient concern that nothing was done at the visit. It has been shown to both increase patient satisfaction and significantly decrease antibiotic prescriptions. Provision of a contingency or follow-up plan is especially important as continuity of care is valued by patients. Providers should clearly explain what to do if a patient does not improve in the expected time frame. Finally, the use of delayed prescribing of antibiotics can be considered and has been shown to decrease overall antibiotic use. In this instance, the patient is given a prescription for an appropriate antibiotic and told only to fill it if symptoms are not improving within a set number of days. This approach has been effectively utilized for a number of respiratory illnesses including pharyngitis, otitis media and bronchitis.

Becoming a Good Antibiotic Steward - What can I do?

Antibiotic stewardship programs have traditionally been hospital-based. To effectively address the growing problem of antibiotic resistance it is important to apply these same principles to the outpatient setting. The CDC has outlined four core elements of outpatient antibiotic stewardship:

1. **Commitment** - From both clinicians and organizational leadership
2. **Action** – Implementation of at least one policy or practice that supports these efforts
3. **Tracking and Reporting** – Measurement of how the organization is performing and feedback on these efforts to providers
4. **Education and Expertise** – Education of both clinicians and patients on appropriate antibiotic use and access to experts on this topic

To effectively discuss these issues with patients, clinicians need training in communication skills. The use of patient handouts and other educational materials is an important adjunct to educational efforts and serves to reinforce the messages discussed during the office visit. Materials on appropriate antibiotic use have been developed for both providers and patients by the CDC and can be found at the Get Smart about Antibiotics website at <https://www.cdc.gov/getsmart/community/materials-references/print-materials/index.html>.

Antibiotic Stewardship Initiatives

Currently, there are several initiatives addressing the issue of antibiotic stewardship that providers and facilities may wish to participate in.

QIN-QIO Initiative: Combating Antibiotic-Resistant Bacteria through Antibiotic Stewardship in Communities

Outpatient settings have been invited to work in partnership with the Centers for Medicare & Medicaid Services (CMS) Quality Innovation Network Quality Improvement Organizations (QIN-QIOs) and the CDC by employing a community-based antibiotic stewardship approach based on the CDC's Core Elements of Outpatient Antibiotic Stewardship. The QIN-QIO team is working to establish and implement antimicrobial stewardship program activities that are effective, sustainable and can be tailored to the clinical needs of each setting. Through this initiative, outpatient settings will gain support from atom Alliance (Mississippi is part of atom Alliance QIN-QIO) to implement antibiotic stewardship programs and develop strategies to optimize antibiotic use. For additional information see <http://atomalliance.org/initiatives/coordination-of-care/antibiotic-stewardship/>

The AHRQ Safety Program for Improving Antibiotic Use: A National Program for Antibiotic Stewardship

The Agency for Healthcare Research and Quality (AHRQ), in conjunction with the Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality and NORC at The University of Chicago, created the AHRQ Safety Program for Improving Antibiotic Use to develop and implement a bundle of interventions designed to improve antibiotic stewardship and antibiotic prescribing practices across acute care, long-term care, and ambulatory care facilities across the United States.

Acute-care hospitals across the United States and Puerto Rico can now register for this 12-month project, which begins in December 2017. More information about participating in the project can be obtained at the website: https://safetyprogram4antibioticstewardship.org/_project/public/Participants. Future cohorts are planned for long-term care facilities (beginning December 2018) and ambulatory and urgent care facilities (December 2019).

References available on request

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Mississippi

Provisional Reportable Disease Statistics

July 2017

		Public Health District									State Totals*			
		I	II	III	IV	V	VI	VII	VIII	IX	July 2017	July 2016	YTD 2017	YTD 2016
Sexually Transmitted Diseases	Primary & Secondary Syphilis	1	0	0	2	2	0	0	2	2	9	41	165	189
	Early Latent Syphilis	3	0	4	1	4	3	0	1	3	19	38	245	287
	Gonorrhea	76	74	81	59	184	63	22	93	92	744	638	4,457	3,822
	Chlamydia	182	152	180	146	493	168	90	170	172	1,753	1,583	9,993	11,324
	HIV Disease	5	6	2	1	9	1	1	12	3	40	38	283	261
Mycobacterial Diseases	Pulmonary Tuberculosis (TB)	0	0	1	0	1	0	0	0	0	2	5	25	23
	Extrapulmonary TB	0	0	0	0	1	0	1	0	0	2	1	3	7
	Mycobacteria Other Than TB	2	5	0	1	7	4	1	3	2	25	27	225	219
Vaccine Preventable Diseases	Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0	0	0	2	2	0	22	1
	Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	1
	Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Measles	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mumps	0	0	0	0	0	1	0	0	0	1	0	20	0
	Hepatitis B (acute)	0	1	0	0	0	0	0	0	2	3	5	23	15
	Invasive <i>H. influenzae</i> disease	1	0	0	0	0	0	1	1	1	4	2	36	39
	Invasive Meningococcal disease	0	0	0	0	0	0	0	0	0	0	0	2	0
Enteric Diseases	Hepatitis A (acute)	0	0	0	0	0	0	0	0	0	0	0	2	3
	Salmonellosis	11	14	8	13	39	13	8	21	20	147	165	531	512
	Shigellosis	0	1	0	0	2	0	0	0	2	5	3	86	34
	Campylobacteriosis	5	7	4	2	7	3	3	5	16	52	20	282	124
	<i>E. coli</i> O157:H7/STEC/HUS	0	0	0	0	0	0	0	0	1	1	3	13	12
Zoonotic Diseases	Animal Rabies	0	0	0	0	0	0	0	0	0	0	0	1	1
	Lyme disease	0	0	0	0	0	0	0	0	0	0	0	1	0
	Rocky Mountain spotted fever	1	4	0	1	2	1	0	1	3	13	15	75	60
	West Nile virus	1	0	2	0	5	1	1	6	0	16	7	19	11

*Totals include reports from Department of Corrections and those not reported from a specific District.