Outpatient Antibiotic Use and Stewardship in Minnesota

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Outpatient Antibiotic Use Summary

- Measuring Antibiotic Use (AU)
- Total Outpatient AU
  - Minnesota and U.S. Estimates
- Appropriate AU
  - US Estimates
  - HEDIS Measures-Minnesota
- National Goal for Reduced Inappropriate AU

Survey Summary Reports

- 2015 Dental Survey
- 2017 Outpatient Clinic Survey
- 2018 Community Pharmacy Survey

Resources and Tools

- Commitment Toolkit
- Factsheets
- Website
- Others
Measuring Antibiotic Use

• **How many antibiotics?**
  - Units: Any Dose – Defined Daily Dose – Days of Therapy – Among others
  - Outpatient Oral Antibiotics: Prescriptions

• **Total Antibiotic Use**
  - Data Sources: Medical records, health and pharmaceutical claims, drug administration records, drug purchasing data, pharmacy dispensing data
  - Outpatient: Medical records, health and pharmaceutical claims, pharmacy dispensing data
  - Examples today: Pharmacy dispensing data, medical records
**Appropriate Antibiotic Use**

Harder to Measure

Subjectivity – Inconsistent or incomplete documentation

Uncertainty involved in prescribing

Data Sources: each possible source limited differently

Examples today: Medical records – coded diagnoses, health and pharmaceutical claims
Total and Appropriate Antibiotic Use

Key Study:

2010-2011 National surveys: medical records reviewed as basis for estimates
National Ambulatory Care Medical Care Survey (NACMS) and National Hospital Ambulatory Medical Care Survey (NHAMCS)

Regional and National Estimates:
Visits with antibiotic prescriptions
Visits for common outpatient infections
Percent with appropriate antibiotics
Total Antibiotic Use: Key Findings

Outpatient Antibiotic Prescribing Rate:
506/1000 persons per year

Regional Variation:
- West: 423/1000
- Midwest: 497/1000
- Northeast: 525/1000
- South: 553/1000

Age Variation:
- 0-19 years: 646/1000
- 20-64 years: 418/1000
- 65+ years: 617/1000

U.S. Estimates: Total Antibiotic Prescriptions by Diagnosis

Figure 1
Outpatient Antibiotic Prescriptions by Diagnosis

Note: Not pictured are influenza and viral pneumonia. There are not enough visits with an antibiotic prescribed in the data set to calculate reliable estimates for these diagnoses individually. Both diagnoses do contribute to the total number of antibiotics prescribed for acute respiratory conditions.

Source: Analysis of NAMCS and NHAMCS data on U.S. antibiotic prescribing, 2010-2011


Permission of Pew Charitable Trusts: http://pewtrusts.org/antibiotics
### Estimated Appropriate and Inappropriate Antibiotic Prescriptions per 1,000 Persons, U.S. 2011

<table>
<thead>
<tr>
<th></th>
<th>Total Prescriptions per 1000</th>
<th>Estimated Appropriate Prescriptions</th>
<th>Estimated Inappropriate Prescriptions</th>
</tr>
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<tbody>
<tr>
<td><strong>Acute Respiratory Conditions</strong></td>
<td>221</td>
<td>50%</td>
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<td><strong>Other Conditions</strong></td>
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HEDIS Measures of Antibiotic Appropriateness

Healthcare Effectiveness Data and Information Set

Defined quality measures collected by health plans

Appropriate Treatment for Children with Upper Respiratory Infection (URI)

Percent of children 3 months-18 years diagnosed with URI not given an antibiotic within 3 days of an office visit

Health claims data

Avoidance of Antibiotics in the Treatment of Adults with Acute Bronchitis

Ages 18-64 years

Exclusions for chronic bronchitis and immunocompromising comorbidities

Health claims data

Source: Minnesota Community Measurement, HEDIS Measure

Percent of Patients

- 2014: 89.90%
- 2015: 90.60%
- 2016: 91.70%
- 2017: 91.30%

One year measurement periods ending June 30 of each year.
Proportion of Acute Bronchitis Patients, 18-64 years Without Antibiotics Prescribed, Minnesota, 2014-2017

Source: Minnesota Community Measurement, HEDIS Measure
White House National Action Plan to Combat Antibiotic Resistant Bacteria

Goal: By 2020, reduce inappropriate outpatient antibiotic use by 50%

The necessary reduction in total antibiotic use to reach this goal: 15%

Pew Report:


Pew Infographic:

Estimated Potential Reductions in Inappropriate Antibiotic Prescribing

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<th>Potential Reduction</th>
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2015 Dental Survey

http://www.health.state.mn.us/onehealthabx/
AS in Dental Prescribing

- Dentists are important partners in antibiotic stewardship (AS)
  - Prescribe 10% of antibiotics in US outpatient settings\(^1\)
  - Penicillins commonly prescribed, consistent with prescribing guidelines\(^2\)
  - Many broad-spectrum antibiotics (macrolides and quinolones) also prescribed, although dental indications are limited\(^3\)

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\(^1\)US outpatient antibiotic prescribing variation according to geography, patient population, and provider specialty in 2011. CID 2015;60:1308-1316


\(^3\)2015 study accepted for publication in *General Dentistry*
• Conducted in partnership with MN Dental Association and MN Board of Dentistry
• Response rate = 16% (n=437)
• Dentists prescribe in more situations than recommended by practice guidelines
  • Patient vacations (38%), liability concerns (24%), patient demand (22%)
  • Excessive prophylaxis for cardiac and prosthetic joints prior to invasive procedures (Guidelines revised in 2007 and 2015)
• Challenges: prophylaxis disagreements among specialists, primary care, and dentists; uncertainty about new guidelines
• Needs: information concerning antibiotic selection and risks, including adverse effects, \textit{Clostridium difficile} infection, and antibiotic resistance (AR)
2017 Outpatient Clinic Survey

http://www.health.state.mn.us/onehealthabx/outsurvey.pdf
AS in Outpatient Clinics

- 60% of antibiotics occur in outpatient settings\(^1\)
- 30% of outpatient antibiotics are inappropriately prescribed\(^2\)
- CDC published Core Elements of Outpatient AS in 2016\(^3\)

Outpatient Clinic Survey Results: Commitment to AS

- 116 participated in online survey (1 responder/clinic)
- Large interest and commitment from providers regarding AS
- 51% of clinics made a formal commitment by leadership to improve and monitor AU
- 14% have developed written AS policy and 12% included AS-related duties in job description

http://www.health.state.mn.us/onehealthabx/outsurvey.pdf
### Barriers to Stewardship
- Lack access to experts, 10%
- Inadequate technology, 15%
- Lack clinician commitment, 16%
- Lack treatment guidelines, 16%
- Lack awareness/education, 17%
- Disinterest from leadership, 22%
- Lack prescriber accountability, 22%
- Patient pressure, 34%
- Lack staff time, 47%

### Facilitators to Stewardship
- Webinar trainings, 16%
- Technology support, 16%
- Funding opportunities, 22%
- Facility collaboration, 32%
- Leadership commitment, 43%
- Patient education, 52%
- Developed guidelines, 53%
Outpatient Clinic Survey Results: AS Actions

- Delayed prescribing/watchful waiting (60%)
- Syndrome treatment guidelines (42%)
- Eliminate standing orders for antibiotics (21%)
- Use antibiogram as a prescribing reference (20%)
- Symptom relief prescription pad (15%)
- Facility tracking antibiotic use (7%)

http://www.health.state.mn.us/onehealthabx/outsurvey.pdf
2018 Community Pharmacy Survey

http://www.health.state.mn.us/onehealthabx/cpharmsurv.pdf
Community Pharmacy Survey Results: Role in AS

- Conducted in partnership with MN Board of Pharmacy and MN Pharmacists Association
  - Response rate = 7% (n=177)
- >80% believe community pharmacists are important to AS and AR prevention
- >40% of pharmacies provide AS and AR education to staff
- 10% of pharmacies have written AS policy
- 25% of pharmacists educate patients about AS and AR
- During influenza season: on average suspected 9.5 prescriptions/month inappropriate
- Discuss/clarify/offer alternative to prescriber: 2 prescriptions/week

http://www.health.state.mn.us/onehealthabx/cpharmsurv.pdf
# Community Pharmacy Survey Results: AS Actions and Barriers

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<th>Barriers</th>
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<tr>
<td>• Use clinical guidelines (33%)</td>
<td>• Not enough time to review prescriptions or educate patients</td>
</tr>
<tr>
<td>• Display information about medication disposal (30%)</td>
<td>• No compensation for time spent on AS</td>
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<tr>
<td>• Confirm antibiotic need and dose with prescriber (19%)</td>
<td>• Prescriber resistance to questioning from pharmacists</td>
</tr>
<tr>
<td>• Request indication or diagnosis (11%)</td>
<td>• Insufficient information to assess appropriateness (lack of indication or diagnosis)</td>
</tr>
<tr>
<td>• Engage with local prescribers/clinics to review antibiotic use (10%)</td>
<td>• Patients expect antibiotics and consider them a cure-all</td>
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<tr>
<td>• Track pharmacy antibiotic dispensing data (7%)</td>
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<tr>
<td>• Publically display commitment to AS (5%)</td>
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http://www.health.state.mn.us/onehealthabx/cpharmsurv.pdf
Resources and Tools

How is MDH using the survey data?

http://www.health.state.mn.us/onehealthabx/
Commitment Posters

I PLEDGE to use antibiotics responsibly!

- I will never take antibiotics for a virus, such as flu or a cold.
- I will never skip doses or stop an antibiotic early unless directed by my health care provider.
- I will wash my hands, cover my cough, and stay home when I feel ill.
- I will discard any leftover medications appropriately.
- I will get recommended vaccines.

We Can Do It!

Antibiotics are used to treat infections caused by bacteria.
Antibiotics won’t help for some common bacterial infections including most cases of bronchitis, many sinus infections, and some ear infections.

KEEP CALM AND PRESCRIBE ANTIBIOTICS APPROPRIATELY

I made a commitment to responsible antibiotic prescribing!

Learn more about antibiotic resistance and stewardship at:

http://www.health.state.mn.us/onehealthabx/commitkit/index.html
Community Pharmacists: Essential Partners in Minnesota Antibiotic Stewardship

Antibiotic Resistance and Stewardship for Minnesota’s Dental Professionals

Antibiotic Resistance

- Antibiotic resistance is one of our most serious health threats.
- CDC estimates that each year in the U.S., 2 million people develop infections from antibiotic-resistant bacteria and 23,000 die from associated causes.
- The major driver of antibiotic resistance is widespread antibiotic use.
- An estimated 50% of outpatient antibiotics are inappropriate.
- Antibiotic stewardship, or the improvement of antibiotic use while effectively treating infections, is essential in combating resistance.

Other Consequences of Antibiotic Use

- Antibiotics are used to treat bacterial infections by killing bacteria or by preventing bacteria from multiplying.
- Antibiotics do not work for viral infections, such as the common cold and flu.
- Unfortunately, it is not uncommon for antibiotics to be prescribed when they aren’t needed, especially for respiratory tract infections and urinary tract conditions.
- The Centers for Disease Control and Prevention (CDC) report that up to 60% of antibiotics in hospitals, clinics, and nursing homes are unnecessary or incorrectly prescribed.

Antibiotic Use and Antibiotic Resistance: Answers for patients

Why are antibiotics used in health care?

- Antibiotics are used to treat bacterial infections by killing bacteria or by preventing bacteria from multiplying.
- Antibiotics do not work for viral infections, such as the common cold and flu.
- Unfortunately, it is not uncommon for antibiotics to be prescribed when they aren’t needed, especially for respiratory tract infections and urinary tract conditions.
- The Centers for Disease Control and Prevention (CDC) report that up to 50% of antibiotics in hospitals, clinics, and nursing homes are unnecessary or incorrectly prescribed.

What is antibiotic resistance, and how does it happen?

- Bacteria that are not killed or controlled by antibiotics are considered “resistant.”
- Antibiotic use, both appropriate and inappropriate, can contribute to antibiotic resistance.
- When antibiotics are used, bacteria develop defenses against them. Bacteria that can withstand antibiotic effects survive, multiply, and can be transferred among people.
- Resistance genes are sometimes shared among bacteria, providing instructions for withstand antibiotics.

Why should we care about antibiotic resistance?

- The growing problem of antibiotic resistance means that more infections are difficult, and sometimes impossible, to treat.
- CDC estimates that 2 million people acquire resistant infections yearly in the U.S., and 23,000 die as a result.
- This problem impacts every area of health care, from general practice (e.g., routine outpatient infections) to advanced medical procedures, such as surgery and cancer treatment, in which patients are at high risk for infection.
- In addition to targeting bad bacteria, antibiotics can affect a person’s helpful gut bacteria, leaving patients at risk for other serious infections, such as Clostridium difficile infection (CDI).

http://www.health.state.mn.us/onehealthabx/materials.html
Search “MDH One Health”
or
health.state.mn.us/onehealthabx
Additional and Upcoming Resources

Additional Resources and Tools

• HAI/AR and One Health AS newsletters – sign up online!

• Today’s AS conference and similar events

• MDH staff:
  • HAI/AR unit; Infection Control Assessment and Response (ICAR) team
  • 651-201-5414
  • health.stewardship@state.mn.us

Upcoming Resources and Tools

• Pharmacy and dental commitment posters

• Medication disposal documents

• Antibiotic use tracking tool

• How-to guide for making cough and cold care kits

• Outpatient advisory group
  • Interested in joining? Contact me! emma.leof@state.mn.us

http://www.health.state.mn.us/onehealthabx/
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http://www.health.state.mn.us/onehealthabx/