Ambulatory Care- Antibiotic Stewardship Programs (ASP) In the Indian Health Service

CDR Robin Bartlett, PharmD, MSP, CPC
October 22, 2015
Objectives

• Understand the affects of antibiotic overprescribing in the ambulatory/outpatient setting
  • Adverse events related to antibiotics
  • The concept of collateral damage, the ramifications of resistant organisms and their economic burden

• Review the Core Principles of ASP and the implementation of ASP in the ambulatory setting

• Identify Examples & Unique Opportunities of ASP
High Rates of Antibiotic Prescribing

Antibiotic prescribing rates by state across the U.S. (2012/13)*

*Prescribing data from July 2012 through June 2013; population data from 2012

http://www.cdc.gov/getsmart/community/materials-references/graphics.html
Overuse of Antibiotics in the Ambulatory Setting

- When looking at costs, the majority of antibiotic prescribing is in the community setting

For 2009, total costs $10.7 billion

- Community: 6.5
- Hospitals: 3.6
- Nursing homes: 0.5

Antibiotic Overprescribing

• Between 20-50% of antibiotic prescriptions are either unnecessary or inappropriate
  • Lack of indication (bronchitis, viral infection, etc)
  • Inappropriate use of broad spectrum antibiotics
  • Inappropriate antibiotic choice (for the pathogen or site of infection)
  • Excessive length of therapy
  • Dosing not optimized

• Antibiotics are responsible for almost 1 out of every 5 Emergency Department visits for drug-related adverse events


<table>
<thead>
<tr>
<th>Condition</th>
<th>Treated with Abx</th>
<th>% Receiving Broad-spectrum Abx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory</td>
<td>38%</td>
<td>74%</td>
</tr>
<tr>
<td>Abx indicated</td>
<td>65%</td>
<td>65%</td>
</tr>
<tr>
<td>Abx not indicated</td>
<td>51%</td>
<td>80%</td>
</tr>
<tr>
<td>Other respiratory</td>
<td>23%</td>
<td>76%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
<td>52%</td>
</tr>
<tr>
<td>Skin</td>
<td>13%</td>
<td>38%</td>
</tr>
<tr>
<td>UTI</td>
<td>60%</td>
<td>69%</td>
</tr>
<tr>
<td>GI</td>
<td>10%</td>
<td>77%</td>
</tr>
</tbody>
</table>

Some Reasons for Antibiotic Overprescribing

• Doctors may prescribe antibiotics before receiving test results that identify the actual cause of infection

• People who want quick relief from symptoms (i.e. viral infections) may pressure doctors for antibiotic prescriptions

• People may take antibiotics purchased abroad or from other family members for self-diagnosed illnesses

• People may take antibiotics leftover from a prior prescription
Collateral Damage

• Antibiotics are unique-

*When they are used by one person it affects the whole population by alteration of the microbial ecology!*
Consequences of Antibiotic Use

Estimated minimum number of illnesses and deaths caused by antibiotic resistance*:

At least 2,049,442 illnesses, 23,000 deaths

*bacteria and fungus included in this report

Estimated minimum number of illnesses and death due to Clostridium difficile (C. difficile), a unique bacterial infection that, although not significantly resistant to the drugs used to treat it, is directly related to antibiotic use and resistance:

At least 250,000 illnesses, 14,000 deaths

How Resistance Happens

1. Lots of germs. A few are drug resistant.
2. Antibiotics kill bacteria causing the illness, as well as good bacteria protecting the body from infection.
3. The drug-resistant bacteria are now allowed to grow and take over.
4. Some bacteria give their drug-resistance to other bacteria, causing more problems.

Antibiotic Resistance

• The increasing number of drug-resistant infections results in:
  • Extended recoveries
  • Lengthier hospitalizations
  • More doctor visits
  • Less effective or more-invasive treatments that are more expensive
  • More-serious illness or disability
  • Increased deaths from previously treatable illnesses
Case in Point: *Clostridium difficile* Infection

- 14,000 deaths due to *C. diff* annually
- Antibiotic exposure is the **single** most important risk factor
- Exposure to antibiotics increases the risk of *C. diff* infection by at least 3 fold for at least a month
- Up to 85% of patients with *C. diff* infection had antibiotic exposure in the 28 days prior to infection

*CDC National Center for Health Statistics, 2012*
Antibiotic Use Rates are Decreasing

A decade’s difference: Doctor visits resulting in antibiotic prescription

1995–96 vs. 2005–06

- **Ear Infections**: 77.1% (1995–96) vs. 70.8% (2005–06)
- **Colds**: 37.3% (1995–96) vs. 52.1% (2005–06)
- **Bronchitis**: 57.3% (1995–96) vs. 74.8% (2005–06)
- **Sore Throats**: 46.5% (1995–96) vs. 68.6% (2005–06)
- **Sinusitis**: 61.8% (1995–96) vs. 69.9% (2005–06)

Data Source: National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey

http://www.cdc.gov/getsart/community/materials-references/graphics.html
Rationale for Antimicrobial Stewardship

• Improved patient outcomes
• Minimize the unintended consequences of antibiotic use such as:
  • Toxicity
  • Emergence of resistant strains
  • Super-infections (C.diff)
• Reduction of healthcare costs without impacting quality of care
Antimicrobial Stewardship

• Strategic efforts to optimize antimicrobial prescribing
  • Right use (when needed vs. not needed)
  • Right drug
  • Right dose
  • Right duration
CDC Core Elements of ASP: 
*Indian Health Service Success Stories*

- Leadership Commitment
- Accountability
- Drug expertise
- Action to improve use
- Tracking
- Reporting
- Education

http://wwwdev.cdc.gov/getsmart/healthcare/pdfs/core-elements.pdf
# IDSA- ASP Strategies and Supplemental Elements

<table>
<thead>
<tr>
<th>Core Strategies</th>
<th>Potential Advantages</th>
<th>Potential Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prospective audit with direct intervention and feedback (IDSA-AI)</td>
<td>• Reduction in inappropriate antimicrobial use</td>
<td>• Difficulty identifying patients with inappropriate therapy and communicating with prescribers</td>
</tr>
<tr>
<td></td>
<td>• Education and modification of future prescribing</td>
<td>• Legal concerns about failure to follow written recommendations</td>
</tr>
<tr>
<td></td>
<td>• Preservation of prescriber autonomy</td>
<td></td>
</tr>
<tr>
<td>Formulary restriction and preauthorization requirements (IDSA-AII, BII, BIII)</td>
<td>• Immediate and substantial reductions in antimicrobial use and costs</td>
<td>• Increased staffing requirements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Delayed initiation of therapy while awaiting approval from authorized prescriber</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increased use of and resistance to alternative antimicrobial agents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Prescriber pushback due to perceived loss of autonomy</td>
</tr>
</tbody>
</table>

## IDSA- ASP Strategies and Supplemental Elements (continued)

<table>
<thead>
<tr>
<th>Supplemental Elements</th>
<th>Potential Advantages</th>
<th>Potential Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Guidelines and Clinical Pathways (IDSA-AI)</td>
<td>• Improved antimicrobial use and reduced practice variation</td>
<td>• Poor adherence</td>
</tr>
</tbody>
</table>
| Education (IDSA-AIII) | • Improved prescribing behavior and acceptance of ASP strategies | • Marginal efficacy for modifying prescribing behavior when used without active intervention  
• Need for repetition |
| Dose Optimization (IDSA-AII) | • Tailored therapy based on patient characteristics, causative organism, site of infection, and pharmacokinetic and pharmacodynamic characteristics of the antimicrobial agent | • Nursing staff concerns about incompatibilities when prolonged infusions are used |

### IDSA- ASP Strategies and Supplemental Elements (continued 2)

<table>
<thead>
<tr>
<th>Supplemental Elements</th>
<th>Potential Advantages</th>
<th>Potential Disadvantages</th>
</tr>
</thead>
</table>
| Streamlining or De-escalation of therapy (IDSA-AII, AIII)   | • Reduced antimicrobial exposure, selection of resistant pathogens, and health care costs | • Prescriber reluctance to de-escalate therapy when cultures are negative and clinical improvement has been observed  
• Lack of acceptance of assays for bio-markers used to monitor and shorten therapy |
| Antimicrobial Order Forms (IDSA-BII)                        | • Improved antimicrobial use  
• Facilitated implementation of guidelines and clinical pathways | • Inappropriate interruption in therapy due to automatic stop orders  
• Time required to fill out paper forms  
• Time required to evaluate appropriateness of orders |
| Combination Therapy (IDSA-CII)                              | • In theory, improved clinical outcomes and prevention of resistance, especially in selected types of patient and situation | • Sometimes redundant and unnecessary  
• Lack of extensive data demonstrating improved clinical outcomes and reduced resistance |

Potential ASP Opportunities At the local Service Unit

• Designate a pharmacist and physician champion for ASP in the outpatient/ambulatory setting with support from leadership

• Develop an Antibiogram
  • If Service Unit not able to have antibiogram, utilize nearby resources (regional, etc) as well as the state Dept of Health or reference labs for viable information

• Clinical Decision Tools
  • Can utilize antibiogram (if have in facility), evidence-based guidelines (eg IDSA), and local formulary and develop quick orders in EHR
  • Place restrictions on overused medications in EHR
    • e.g. Azithromycin, fluoroquinolones
Potential Opportunities (cont)

• Relay information to practitioners such as:
  • Noted resistance patterns and antibiogram results
  • Practice changing updates (i.e. changes in suggested optimal empiric therapies from AAP or IDSA)

• Tracking
  • Start somewhere: specific disease state or antibiotic
  • Use a Quality Improvement process: Plan, Do, Check, Act
  • Keep it positive
Reducing Antibiotic Use in Ambulatory Setting

- Strategies that combined patient education/ satisfaction with clinician behavior decreased antibiotic prescribing by 6%-21%
- Delayed Antibiotic Prescribing
- Clinical decision supports (CDS) effective
- Passive written materials (less useful)
- Best to involve clinicians in planning the intervention

Vodicka Brit J Gen Pract 2013;612:3445-54
Francis BMJ 2009;339:b2885
ASP: Delayed Antibiotic Prescribing

<table>
<thead>
<tr>
<th>Measure</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes</td>
<td>• No differences for cough and common cold</td>
</tr>
<tr>
<td></td>
<td>• minor differences in pain and fever for sore throat and AOM in some of the studies</td>
</tr>
<tr>
<td>Use of Abx</td>
<td>Delayed antibiotic prescription resulted in significant reduction in antibiotic use (32% vs 93% in immediate group)</td>
</tr>
<tr>
<td>Complications</td>
<td>Little difference between immediate and delayed antibiotics, no difference in re-consulting rates</td>
</tr>
<tr>
<td>Parent Satisfaction</td>
<td>Delay slightly reduces satisfaction compared to immediate antibiotics (87% vs 92%)</td>
</tr>
</tbody>
</table>

Spurling. Cochrane database of systematic reviews 2013;Vol 4
# ASP: Clinical Decision Support

<table>
<thead>
<tr>
<th>Setting</th>
<th>Condition</th>
<th>CDS</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Large VA healthcare systems</td>
<td>CAP, sinusitis, bronchitis, COPD and URI in adults</td>
<td>Providers click on symptoms, get advice on whether to use Abx. Could override computer advice at end</td>
<td>% of unwarranted prescriptions of azithromycin /FQs decreased from 22% to 3%</td>
</tr>
<tr>
<td>104 family practice clinics in UK</td>
<td>Pts aged 18-59 yrs with cough, bronchitis, colds, otitis, sinusitis and sore throat</td>
<td>Providers type in Dx, CDS provides advice on treatment and delayed prescribing strategies, pt info sheet, no active alert or popup</td>
<td>% receiving Abx dropped only 2%, tools not used that often</td>
</tr>
</tbody>
</table>

*Rattinger PlosOne 2012;7(12): e51147
Gulliford Ann Family Med 2014:12:344-51*
ASP: Patient Education

- Place in Exam Room:
- Posters -
  - Patient Education
  - Clinician support of ASP


http://www.cdc.gov/getsmt/community/materials-references/graphics.html
Metrics
Goals of ASP

1. Reduce antibiotic consumption and inappropriate use
2. Improve patient outcomes
3. Increase adherence/utilization of treatment guidelines
4. Reduce adverse drug events
5. Decrease or limit antibiotic resistance
6. (unofficially) establish realistic initial goals and then modify as ASP becomes more accepted
Reduce Antibiotic Consumption and Inappropriate Use

- Appropriate antibiotic selection
  - Based upon current guidelines and local antibiogram data and formulary
  - Based on spectrum of activity and susceptibility of suspected or documented pathogen
  - Based on drug allergies and potential for toxicity

- Appropriate dose, interval, and duration of therapy
  - Avoidance of unnecessarily prolonged therapy
Improve Patient Outcomes

- ER/UCC re-admission visits for same diagnosis
Increase Adherence/Utilization of Treatment Guidelines

- Chart reviews to determine adherence to guidelines for antibiotic selection and duration of therapy
  - Retrospective sample
  - Prospective review by pharmacy
    - Utilization of Electronically driven Medication ordering based upon guidelines, local formulary, and local antibiogram data
  - Percentage of recommendations for antibiotic use implemented/accepted
    - A low rate of implementation suggests a need for education
  - Rate of adherence to institutional guidelines and/or Policies and Procedures
Reduce Adverse Drug Events

- Mining of facility ADE data
  - IHS WebCident System
    - A&B Pharmacy interventions
    - A-I interventions entered by everyone else
  - Other local data collection systems in use
Decrease or Limit Antibiotic Resistance

- Hardest to show

- Antibiograms
  - Clinic specific
  - City/Town
  - County
  - State
  - Region

- Percentage of isolates of a pathogen with antimicrobial resistance
ASP Resources

- IHS NPTC (National Pharmacy and Therapeutics Committee) website: [http://www.ihs.gov/nptc/resources/](http://www.ihs.gov/nptc/resources/)
More ASP Resources

- **National:**

- **Regional:**

- **Local:**
  - Hospital/Health Systems
  - Public Health Departments
  - Laboratory services (Antibiogram)
Examples of Antimicrobial Stewardship Initiatives in IHS
Cherokee Indian Hospital (CIHA)

• Rural Hospital and ambulatory care clinic
• Outpatient clinics services ~17,000 patients
  • ~600 outpatient visits daily
• 6 satellite clinics, including correctional facility and urgent care
• 15 bed inpatient facility with 800 admissions annually
• 20,000 Rx/month
ASP Initiatives at Cherokee Indian Hospital Association (CIHA)

Presentations to Medical Staff

- Highlight recent guideline updates
- DUE for specific antimicrobials
- Specific case presentations

- Could use rotating students to assist in developing / presenting
- P&T Committee, Medical Staff meetings, etc.
Example presentations at CIHA

CDC Sexually Transmitted Diseases Treatment Guidelines 2015

Tessa Jimenez
Pharm.D Candidate, WVU

Drug Use Evaluation: Zosyn
(piperacillin, tazobactam)

Julian Leland, PharmD Candidate 2016

Antibiotics in Pregnancy
Chloe Hwang
Pharm.D candidate of 2015
Antimicrobial Selection Guide at CIHA

• For those that prefer pocket references
• Inclusion of most frequent infectious diseases and local oddities
• If available, provide copy of most recent antibiogram
• Word of caution: updates can be lengthy and time consuming
Antimicrobial Selection Guide
Rural IHS Experience: Northern Navajo Medical Center (NNMC)

- Four Corners region
- ~600 daily outpatient visits
- 55 physicians, 20 mid-level providers
- ~45,000 Rx/month
- ~2,000 ABX/month
Guidelines-Based Antibiotic Selection Menu in EHR at NNMC

• Tool to help guide selection based on national guidelines and local antibiogram
  • Cystitis
    • 80% *E. coli* isolates sensitive to sulfamethoxazole/trimethoprim (SMX/TMP)
  • Acute Sinusitis – no abx first line
    • Guideline-based selection if abx used
  • Acute bronchitis
    • No antibiotics recommended
Quick Order Menus at NNMC

• Develop and maintain quick order menus based on current guidelines
  • Include non-pharmacologic / non-medicinal recommendations
  • Identify when antimicrobials are not recommended
• Prescriber education and buy-in are critical for success
• Joint pharmacist and CAC venture
NNMC
Quick Order Examples

- Pain Medications...
- Antimicrobial Meds...
- Cardiovascular Meds...
- Dermatology Meds...
- Endocrine Meds...
- ENT Meds...
- Gastroenterology Meds...
- Hematology Meds...
- Immunology Meds...
- Supplies (Diabetes or Pill Box etc)
- Outside Prescriptions
- Medications Administered in Clinic...
- FCRHC Dental Pkx...
- Prepackaged Medications (Dispensed in ER)
- Infusion Clinic & Injectable Meds...
- Neurology Meds...
- OB/GYN Meds...
- Otolaryngology Meds...
- Pediatric Meds...
- Podiatry Meds...
- Psychiatry Meds...
- Pulmonology Meds...
- Urology Meds...
- Non Formulary Drug Request
- Free txt Mod Lookup (Outot)...
NNMC
Quick Order Examples

NNMC Guideline Driven Menu

HEAD/VENT
- Acute Sinusitis
- Chronic Sinusitis
- Pharyngitis (Group A)

LUNGS/UPPER RESPIRATORY
- Acute Bronchitis
- Exacerbation of Chronic Bronchitis
- Pertussis
- Pneumonia (Community Acquired)

GENITOURINARY
- Cystitis
- Pelvic Inflammatory Disease (PID)
- Prostatitis
- Pyelonephritis
- Sexually Transmitted Infections

SKIN/SKIN STRUCTURE
- Cellulitis
- Diabetic Foot
NNMC
Quick Order Examples

<table>
<thead>
<tr>
<th>CLINICAL NOTES</th>
<th>TREATMENT (Initial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>~Most cases do NOT warrant antibiotic use</td>
<td><del>FIRST LINE</del></td>
</tr>
<tr>
<td>~Treat with nasal saline washes</td>
<td>[ ] Nasal Saline 2 Sprays QID prn #45ml</td>
</tr>
<tr>
<td>~Consider antihistamines</td>
<td><del>SECOND LINE</del></td>
</tr>
<tr>
<td>~Consider antibiotics ONLY if:</td>
<td>[ ] Amoxicillin/Clavulanate (Augmentin) 500mg TID x 7 Days</td>
</tr>
<tr>
<td>~Fever</td>
<td><del>OR</del></td>
</tr>
<tr>
<td>~Purulent nasal discharge</td>
<td>[ ] Amoxicillin/Clavulanate (Augmentin) 875mg BID x 7 Days</td>
</tr>
<tr>
<td>~Facial pain</td>
<td><del>PENICILLIN ALLERGY</del></td>
</tr>
<tr>
<td>~Symptoms &gt; 10 Days</td>
<td>[ ] Doxycycline 100mg BID x 7 Days</td>
</tr>
</tbody>
</table>

**DO NOT USE**

~Azithromycin
~TMP/SMX (Bactrim)

TREATMENT (If no response OR Severe Sx OR Recent ABX)

~FIRST LINE~
[ ] Amoxicillin/Clavulanate (Augmentin) 2000mg BID x 10 Days

~SECOND LINE~
[ ] Levofloxacin 750mg Daily x 7 Days
~OR~
[ ] Levofloxacin 500mg Daily x 10 Days
NNMC
Quick Order Examples
NNMC
Quick Order Examples
NNMC

Quick Order Examples

[Image of a medical order form with highlighted text]
### Cystitis

**TREATMENT [Uncomplicated]**
- Nitrofurantoin (Macrobid) 100mg BID x 5 Days
  - Efficacy reduced when CrCl < 60ml/min. Do not use
- Cephalexin 500mg BID x 7 Days

**TREATMENT [Pregnant]**
- Nitrofurantoin (Macrobid) 100mg BID x 7 Days

**CLINICAL NOTES**
- Uncomplicated:
  - Female
  - Premenopausal
  - Not pregnant
  - CONTROLLED Diabetic
- Consider testing for Chlamydia
- DO NOT treat asymptomatic bacteriuria
Assessment of guidelines-based antibiotic selection menu at NNMC

• Impact of selection menu on antibiotic appropriateness in the outpatient setting

• Components
  - Computerized Clinical Decision Support (i.e., antibiotic selection menu)
  - Provider Education
  - Assessment of prescribing patterns pre- and post-selection menu implementation
NNMC ASP Timeline

6 months data: APR-SEP 2013

Menu rollout/Education: JAN 2014

6 months data: APR-SEP 2014

Education: SEP 2014

Education: APR 2015
NNMC Prescribing Patterns Assessment: Methods

• EHR was queried for all outpatient visits, age ≥ 18 years:
  • Acute cystitis (595.0, 595.9, 599.0, 599.9)
  • Acute sinusitis (461.0 – 461.9)
  • Acute bronchitis (466.0)

• Appropriateness of empiric therapy was assessed
• A facility-wide survey to assess for provider awareness of, and attitudes towards, the selection menus
## Results

<table>
<thead>
<tr>
<th></th>
<th>Cystitis</th>
<th>Sinusitis</th>
<th>Bronchitis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Visits</strong></td>
<td>2948</td>
<td>3093</td>
<td>168</td>
</tr>
<tr>
<td><strong>Total Patients</strong></td>
<td>1909</td>
<td>1914</td>
<td>150</td>
</tr>
<tr>
<td><strong>% Female</strong></td>
<td>88.3</td>
<td>86.9</td>
<td>60.0</td>
</tr>
<tr>
<td><strong>Median Age</strong></td>
<td>51 (18-100)</td>
<td>53 (18-99)</td>
<td>49 (18-90)</td>
</tr>
<tr>
<td><strong>% ≥ 65 yrs old</strong></td>
<td>26.7</td>
<td>25.5</td>
<td>22.7</td>
</tr>
</tbody>
</table>
Antibiotic Use by Indication

![Antibiotic Use by Indication Chart](chart.png)

- **Cystitis**
  - 2013: Amoxicillin
  - 2014: Amoxicillin

- **Sinusitis**
  - 2013: Amoxicillin
  - 2014: Amoxicillin

*P < 0.0001*

SMX-TMP = Sulfamethoxazole-Trimethoprim

*Nitrofurantoin menu-preferred
**Amoxicillin-Clavulanate menu-preferred
Changes in Antibiotic Dose and Duration

<table>
<thead>
<tr>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrofurantoin</td>
<td>5%</td>
<td>31%</td>
<td>18%</td>
<td>33%</td>
<td>18%</td>
<td>29%</td>
</tr>
<tr>
<td>Cephalexin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amox / Clav</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sinusitis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Nitrofurantoin: 2013 vs. 2014, p<0.0001
- Cephalexin: 2013 vs. 2014, p<0.0001
- Amox / Clav: 2013 vs. 2014, p=0.12

Matching Menu Recommendations

- Cystitis: Matched Recommendation
- Did Not Match
Antimicrobial Appropriateness by Hospital Location: Acute Cystitis

- Urgent Care: \( p < 0.0001 \)
- Family Medicine: \( p < 0.0001 \)
- ER: \( p = 0.4899 \)
- Internal Medicine: \( p = 0.0454 \)
Antimicrobial Appropriateness by Hospital Location: Acute Sinusitis

- Urgent Care: p = 0.0153
- Family Medicine: p = 0.1050

2013 vs 2014
Prescriber Survey

Reported Use of Guidelines-Based Selection Menu (%,
\( n=26 \))

- 35% have never seen
- 19% have been seen, but do not use
- 31% occasionally use
- 15% always use
NNMC Discussion

• No change overall whether an antibiotic was prescribed
• Improvements in antibiotic chosen were observed
• Improvements in dose and duration were observed
• ER results point to need for EHR utilization
• These changes were in light of limited menu utilization
Red Lake Hospital, Red Lake, MN

- Rural Hospital, Emergency Department, ambulatory care clinic, and long-term care facility.
  - 1 satellite facility
  - 25 bed inpatient facility
- Outpatient clinics services ~13000 patients/year
  - 16,800 Rx/month
Stewardship Initiatives in Red Lake, MN

- Local antibiotic guidelines for empiric therapy were developed incorporating the service unit formulary and antibiograms
  - Included were service unit antibiogram, regional level IV trauma and tertiary referral center and their outpatient clinic
  - Providers were given a condensed pocket version of the guidelines
- Clinical decision support: Pediatric quick orders by indication were developed for the frequently misused antibiotics.
Red Lake Stewardship Initiatives

• Pharmacist provides daily retrospective review of microbiology culture and sensitivities AND patient care plan for all patients with C&S results.

• Main Intervention Categories:
  • Right drug
  • Right dose (based on indication, renal/hepatic function, etc)
  • Right duration
  • No contraindications for therapy
Red Lake Stewardship Initiatives

- Interventions are made if ASP pharmacist deems that therapy or treatment is sub-optimal or lacking
  - Pharmacists contacts the prescriber or the Medical Officer of the Day using EHR with recommendations for treatment
  - Includes extending/reducing duration, different choice of antibiotic or suggested follow-up if deemed appropriate
Red Lake Stewardship Initiatives

• Results of all C & S reports are recorded and analyzed
  • Prescriber
  • Infection site
  • Appropriateness of empiric therapy (including dose and duration)
  • Interventions outcomes—status of recommendation (accepted or rejected)
  • Aggregate data by prescriber is analyzed and included in Medical Staff Ongoing Professional Practice Evaluation (OPPE) QA/QC.
Red Lake Stewardship Initiatives

Patient Case Example:

• Patient is seen in outpatient clinic with diagnosis of UTI (5 in last six months); on micro review the pharmacist notes the organism is resistant to the empirically prescribed medication.
  • The intervention placed in the patients chart in EHR would include a different antibiotic option, dose and duration as well as requesting provider consideration of possible prophylactic therapy, follow-up appt or urology referral
Outcomes-Red Lake

Appropriateness of Therapy

- Inappropriate Antibiotic: 194
- Inappropriate Dose: 37
- Inappropriate Duration: 203
- Contraindications to therapy: 8
Outcomes - Red Lake

Pharmacist Intervention by Type

- Change of Abx: 97
- Change of Dose: 25
- Intervention(s) Accepted: 117

N = 442 inappropriate antibiotics prescribed, 117 pharmacist interventions were accepted by the provider. (26.5%)
Red Lake Discussion

• ASP initiatives have assisted health care providers to ensure that patients receive the most appropriate therapy in a timely manner

• Whatever size the facility even small changes can have a large influence

• Stewardship Team does not have to fit a particular “mold”- antimicrobial stewardship can be a part of daily practice
Conclusions

• Antibiotic resistance is a public health threat
• Tools to optimize antibiotic usage are needed
• Antibiotic stewardship does not have to be complex or costly
• Even small changes can have significant impact
ASP Next Steps - Action Items

• Local Multidisciplinary ASP Team
• Review ASP Resources
• Local/Regional Antibiogram
• Develop Plan
• Implement Strategies
• Educate
• Monitor Metrics
• Quality Assurance / Continuous Improvement
ASP Resources

- IHS NPTC (National Pharmacy and Therapeutics Committee) website: http://www.ihs.gov/nptc/resources/
More ASP Resources

- **National:**

- **Regional:**

- **Local:**
  - Hospital/Health Systems
  - Public Health Departments
  - Laboratory services (Antibiogram)
IHS NPC ASP Workgroup Members

• Dr. Daniel Marino: Daniel.Marino@ihs.gov  Phone: 520-295-2401
• Robin Bartlett: Robin.Bartlett@ihs.gov  Phone: 615-467-1577
• Shani Bjerke: Shani.Bjerke@ihs.gov  Phone: 218-679-3912
• Linda Crosby: Linda.Crosby@ihs.gov  Phone: 541-553-2134
• Jeff Gildow: Jeffrey.Gildow@ihs.gov  Phone: 402-878-2231
• Tim Langford: tglangford@klm.portland.ihs.gov  
  Phone: 541-882-1487 x354
• Chris McKnight: Christopher.McKnight@cherokeehospital.org  
  Phone:828-497-9163 x6379
• Jodi Tricinella: Jodi.Tricinella@ihs.gov  Phone: 918-342-6298
• Kendall Van Tyle: Kendall.VanTyle@ihs.gov  Phone: 505-368-7250
• Thaddus Wilkerson: tdwilkerson@anthc.org  Phone: 907-729-2155
• Ron Won: Roney.Won@ihs.gov  Phone: (503) 414-5579
• Jon Schuchardt: Jon.schuchardt@ihs.gov  Phone: (605) 355-2281