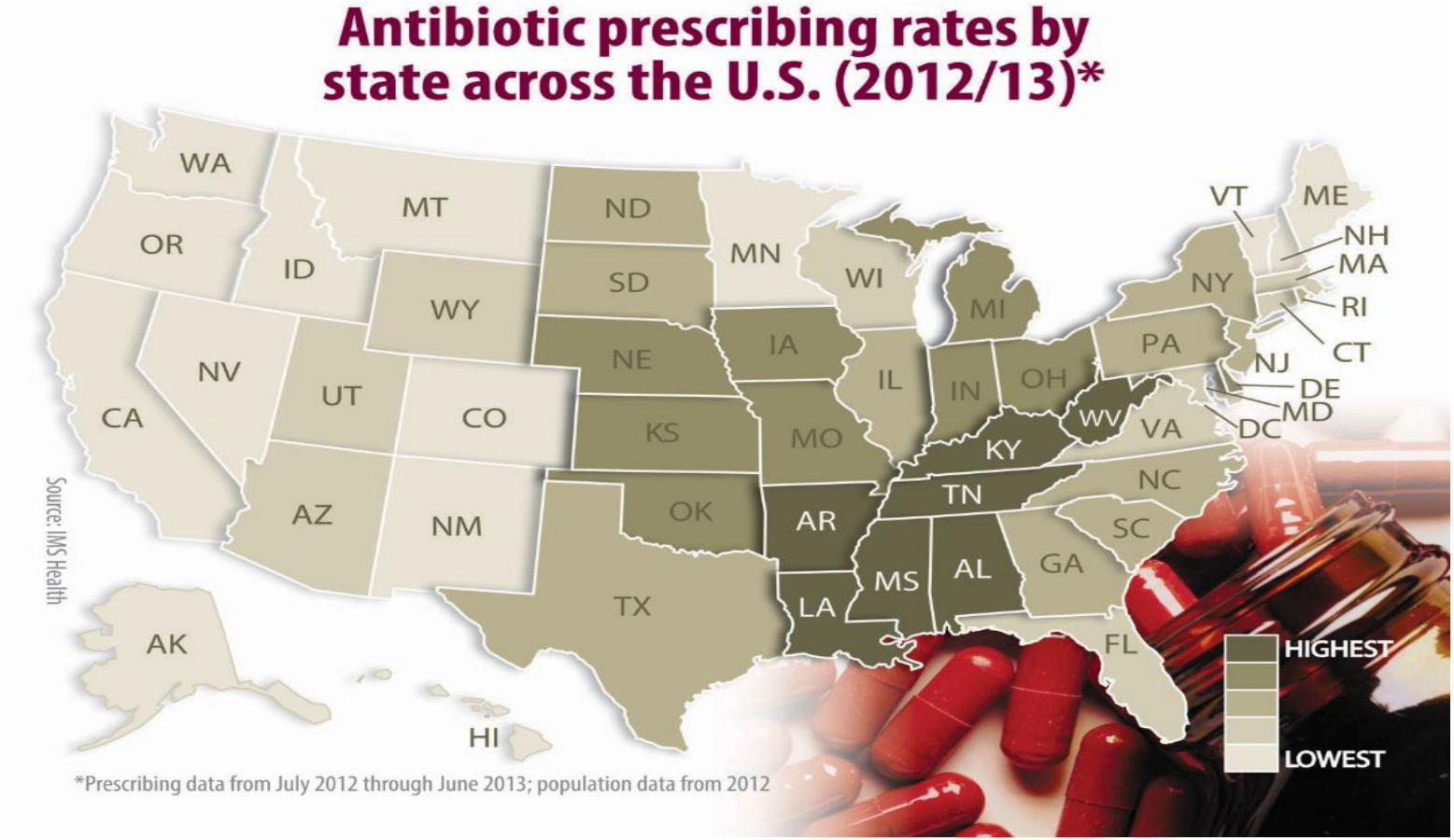
Ambulatory Care- Antibiotic Stewardship Programs (ASP) In the Indian Health Service

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

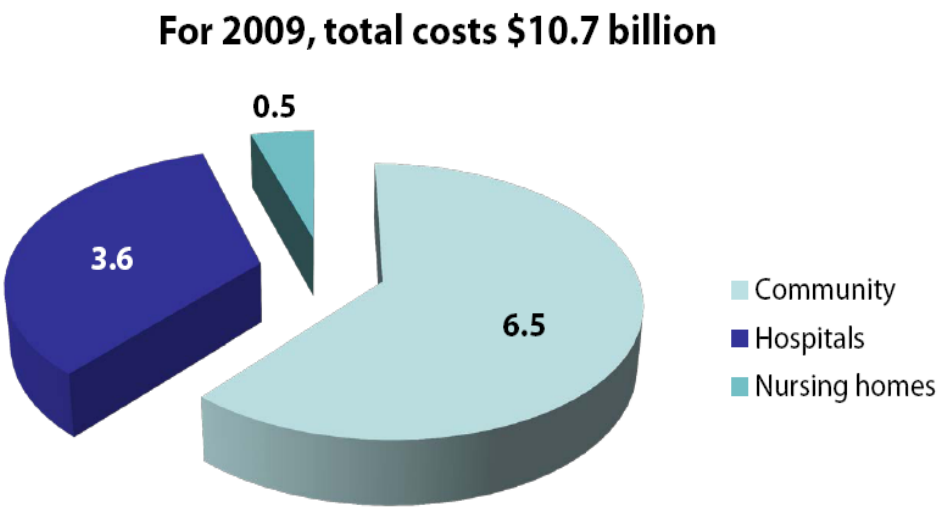
High Rates of Antibiotic Prescribing



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



Suda, et al. J Antimicrob Chemotherapy 2013;68:715-18

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

Fishman N. Am J Med. 2006 Jun;119(6 Suppl 1):S53-61

Shehab, etal. Clin Infect Dis. 2008;47(6):735-43

Antibiotic Prescribing by Condition, US adults 2007-2009

Condition	Treated with Abx	% Receiving Broad-spectrum Abx
Respiratory	38%	74%
Abx indicated	65%	65%
Abx not indicated	51%	80%
Other respiratory	23%	76%
Other	7%	52%
Skin	13%	38%
UTI	60%	69%
GI	10%	77%

Shapiro, et al. J Antimicrob Chemother doi:10.1093/jac/dkt301 2013

Some Reasons for Antibiotic Overprescribing

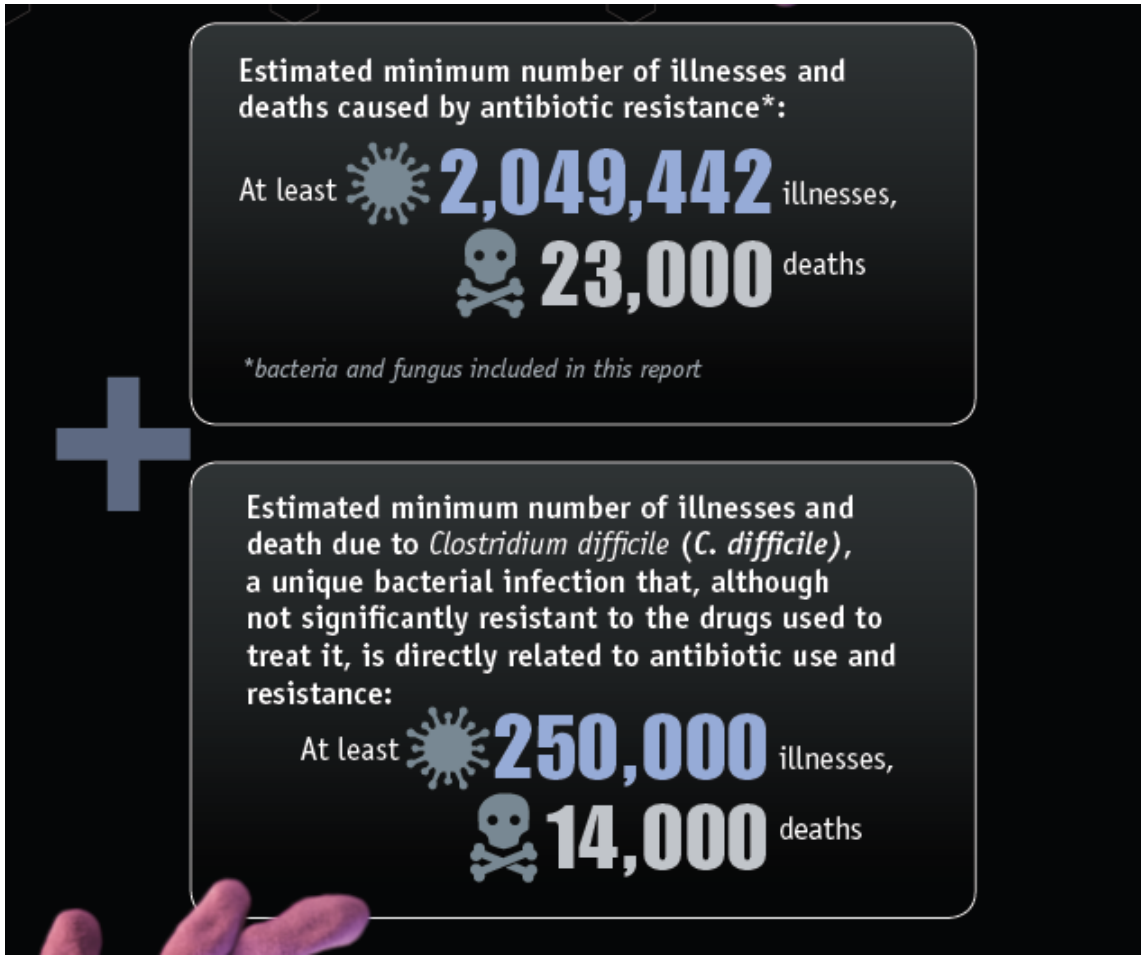
- Doctors may prescribe antibiotics before receiving test results that identify the actual cause of infection
- People who want quick relief from symptoms (i.e. viral infections) may pressure doctors for antibiotic prescriptions
- People may take antibiotics purchased abroad or from other family members for self-diagnosed illnesses
- People may take antibiotics leftover from a prior prescription

Collateral Damage

- Antibiotics are unique-

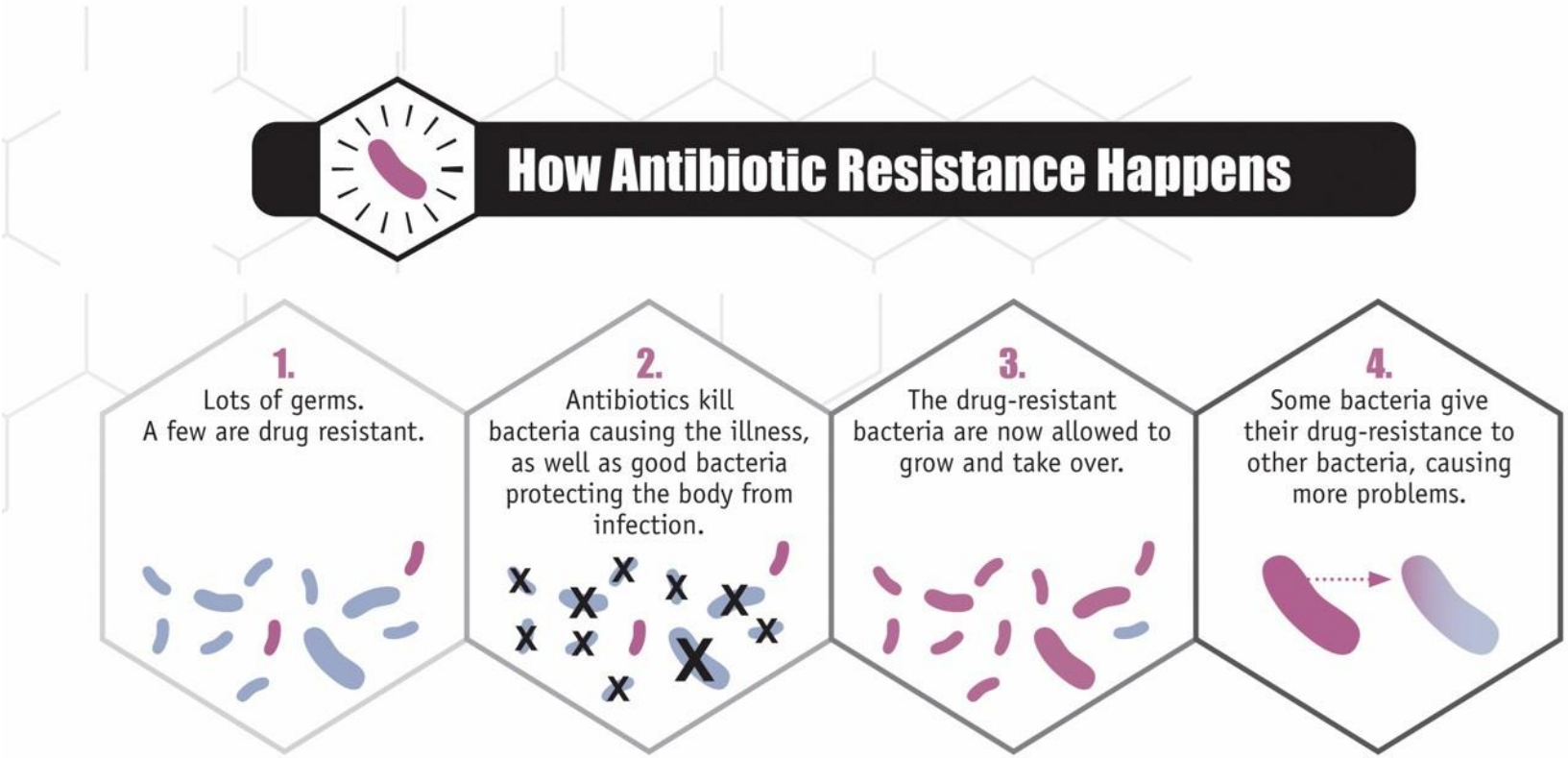
W**hen** they are used by one person it **affects the whole population by alteration of the microbial ecology!**

Consequences of Antibiotic Use



http://www.cdc.gov/drugresistance/pdf/ar-threats-2013-508.pdf

How Resistance Happens



Patel G et al. Infect Control Hosp Epidemiol 2008;29:1099-1106
Zaoutis TE et al. Pediatrics 2005;114:942-9

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

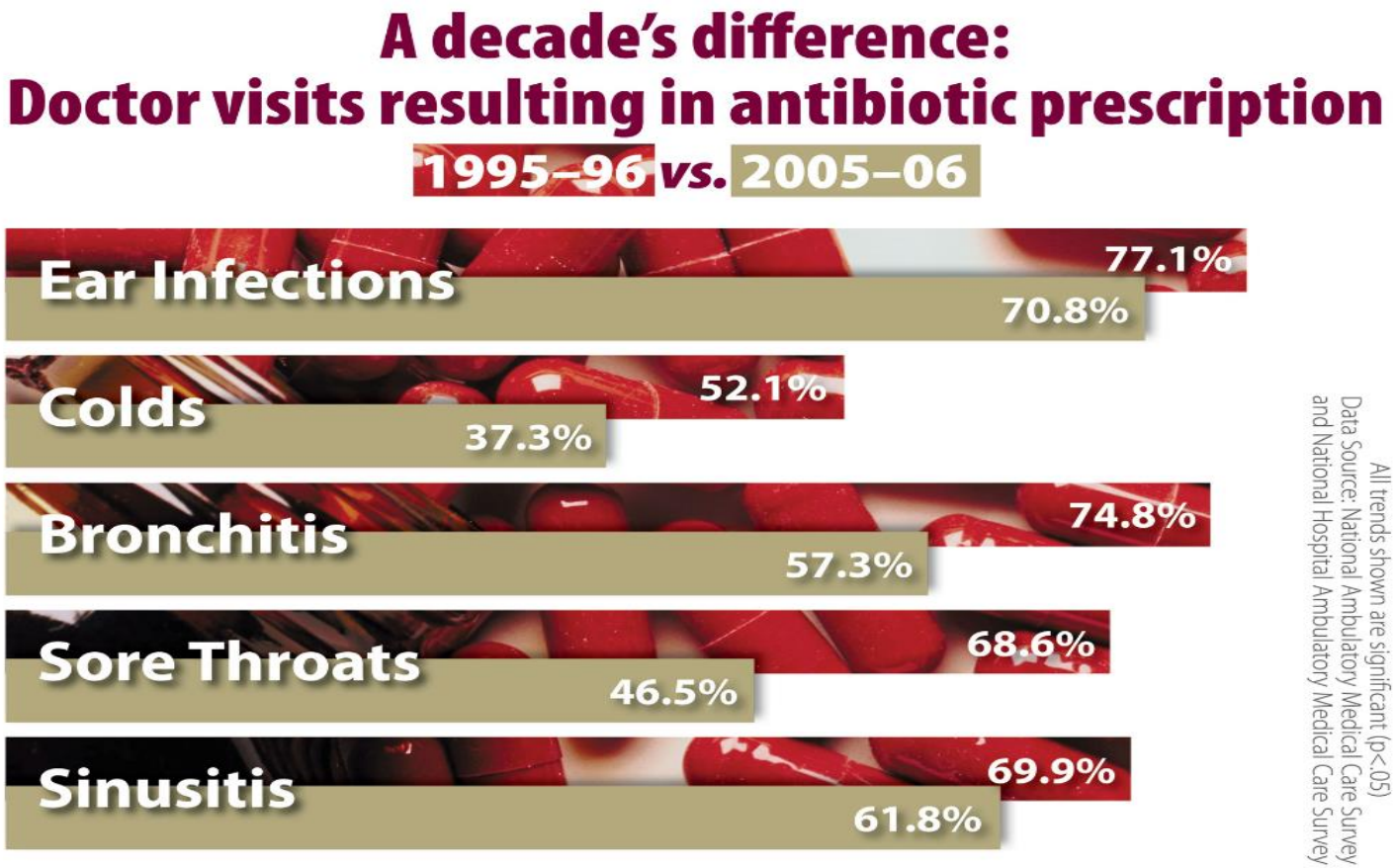
Case in Point: *Clostridium difficile* Infection

- 14,000 deaths due to *C. diff* annually
- Antibiotic exposure is the <u>single</u> 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

Stevens et al. Clin Infect Dis. 2011 Jul 1;53(1):42-8

Antibiotic Use Rates are Decreasing



http://www.cdc.gov/getsmart/community/materials-references/graphics.html

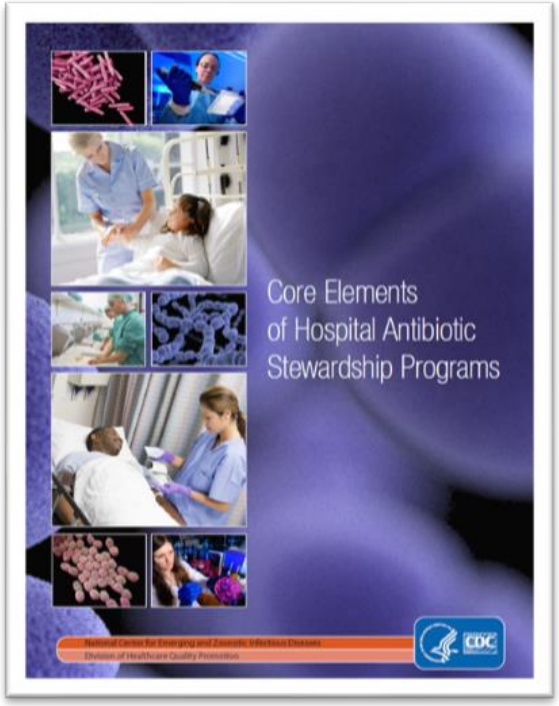
Rationale for Antimicrobial Stewardship

- 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

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

http://www.idsociety.org/stewardship_policy/

IDSA- ASP Strategies and Supplemental Elements (continued)

Supplemental Elements	Potential Advantages	Potential Disadvantages
Local Guidelines and Clinical Pathways (IDSA-AI)	• Improved antimicrobial use and reduced practice variation	• Poor adherence
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

http://www.idsociety.org/stewardship_policy/

IDSA- ASP Strategies and Supplemental Elements (continued 2)

Supplemental Elements	Potential Advantages	Potential Disadvantages
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

http://www.idsociety.org/stewardship_policy/

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

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

Spurling. Cochrane database of systematic reviews 2013;Vol 4

ASP: Clinical Decision Support

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

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**

Characteristic	Poster Condition		Control Condition	
	Baseline	Final Measurement	Baseline	Final Measurement
Inappropriate prescribing rate, % (95% CI)	43.5 (38.5 to 49.0)	33.7 (25.1 to 43.1)	42.8 (38.1 to 48.1)	52.7 (44.2 to 61.9)
Absolute percentage change, baseline to final measurement (95% CI)	−9.8 (0.0 to −19.3)		9.9 (0.0 to 20.2)	
Difference in differences between poster condition and control (95% CI)	−19.7 (−5.8 to −33.04)[b]			

Meeker JAMA Intern Med doi:10.1001/jamainternmed.2013.14191

http://www.cdc.gov/getsmart/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

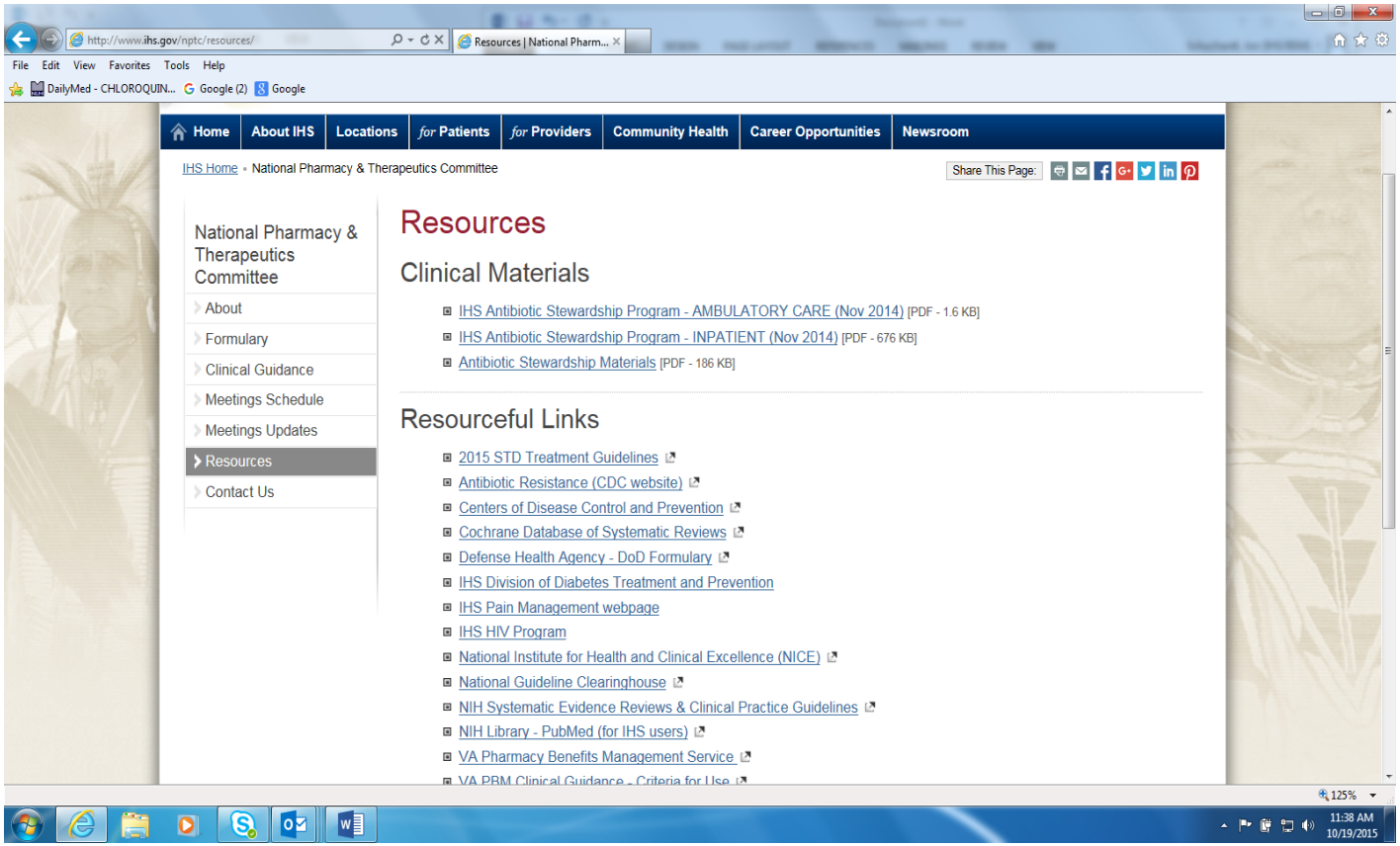
- Mining of facility ADE data
  - IHS WebCident System
    - A&B Pharmacy interventions
    - A-I interventions entered by everyone else
  - Other local data collection systems in use

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/



More ASP Resources

- **National:**
  - **CDC: Get Smart http://www.cdc.gov/getsmart/community/index.html**
  - **National Association http://www.cdc.gov/getsmart/community/partners/current-partners.html**
  - **IDSA http://www.idsociety.org/stewardship_policy/**
- **Regional:**
  - **State ASP programs http://www.cdc.gov/getsmart/community/partners/current-partners.html**
- **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

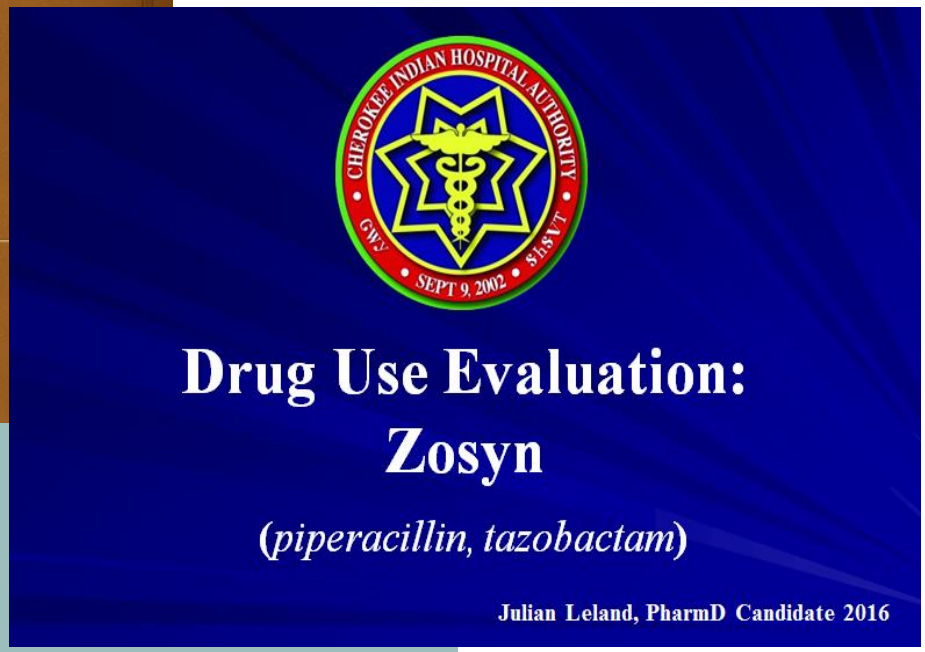
- Highlight recent guideline updates
- DUE for specific antimicrobials
- Specific case presentations

- 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
PharmD Candidate, WVU



ANTIBIOTICS IN PREGNANCY

Chloe Hwang
Pharm.D. candidate of 2015

Antimicrobial Selection Guide at CIHA

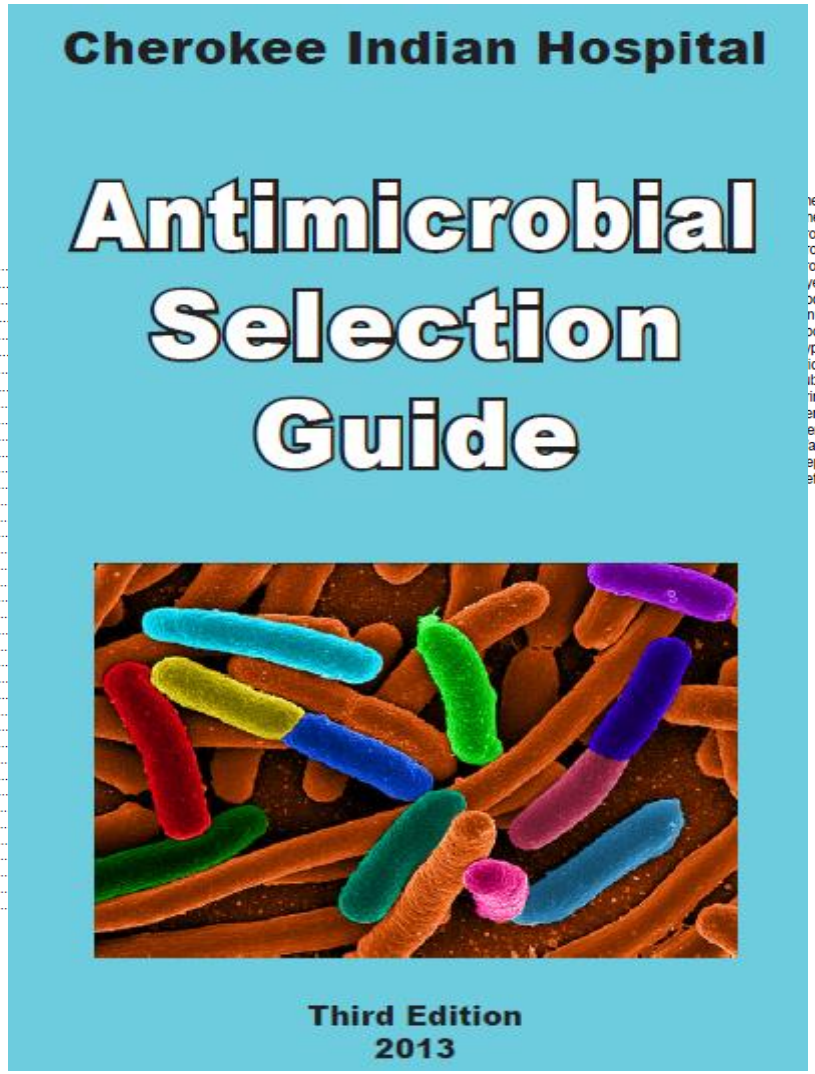
- For those that prefer pocket references
- Inclusion of most frequent infectious diseases and local oddities
- If available, provide copy of most recent antibiogram
- Word of caution: updates can be lengthy and time consuming

Antimicrobial Selection Guide

Table of Contents

CIH Antibiogram for 2012
Animal Contact Infections
Bacterial Vaginosis
Bites, Dog / Cat
Bites, Human
Blastomycosis
Bronchitis (Acute)
Bronchitis (Chronic)
Candidiasis
Catheter Infections
Cellulitis
Chancroid
Chlamydial Infections
Cholecystitis / cholangitis
Coccidiodomycosis
Community Acquired MRSA
Conjunctivitis
Cryptococcal Disease
Dental Infections
Diabetic Foot Infections
Diverticulitis
Dyspepsia
Encephalitis
Endocarditis
Epididymitis
Epiglottitis
Gastroenteritis
Genital Herpes
Gonoccocal Infections
Histoplasmosis
Impetigo
Meningitis
Necrotizing Infections
Neutropenia
Osteomyelitis
Otitis Media
Pancreatitis
Pelvic Inflammatory Disease (PID)
Pharyngitis
Pneumonia, Community-Acquired

1

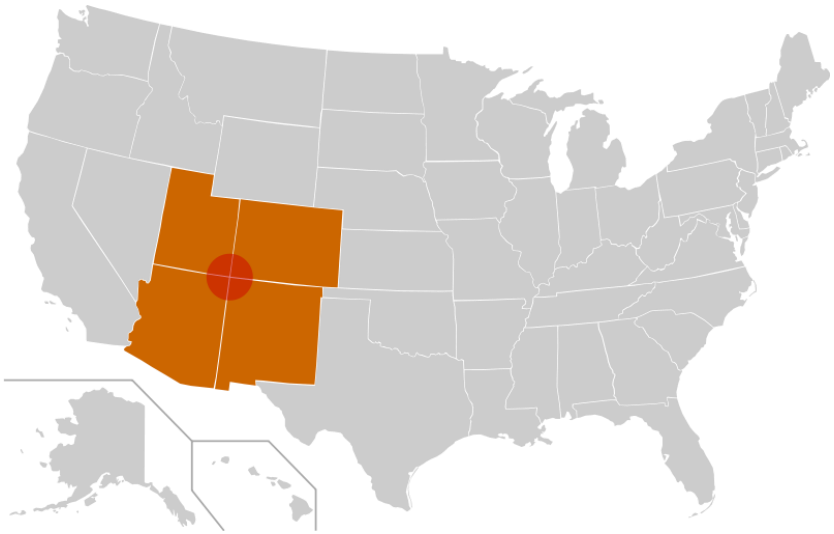


neumonia, Healthcare-Associated....69
neumonia, Hospital-Acquired....70
octitis, Proctocolitis, and Enteritis....72
ostatitis, Acute....72
ostatitis, Chronic....73
yelonephritis....74
ocky Mountain Spotted Fever....76
nusitis....77
porotrichosis....78
yphilis....79
ichomoniasis....83
uberculosis....83
rinary Tract Infections (UTI)....88
enal Dosing Table....91
entamicin Dosing Protocol....99
arfarin-Antibiotic Interactions....103
ephalosporin Chart....110
eferences....111

2

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

Outpt Pharmacy | Done

- Pain Medications...
- Antimicrobial Meds...
  - ~Guideline Based Menu
- Cardiovascular Meds...
- Dermatology Meds...
- Endocrine Meds...
  - ~Diabetes Meds...
- ENT Meds...
- Gastroenterology Meds...
- Hematology Meds...
- Immunology Meds...
  - ~Immunizations...
- Supplies (Diabetes or Pill Box etc)
- Outside Prescriptions
- Medications Administered in Clinic...
- FCRHC Dental Pyxis
- Prepacked Medications (Dispensed in ER)
- Infusion Clinc & Injectable Meds...
- Neurology Meds...
- OB/GYN Meds...
- Optometry Meds...
- Pediatric Meds...
- Podiatry Meds...
- Psychiatry Meds...
- Pulmonary Meds...
- Urology Meds...
- Non Formulary Drug Request
- Freetext Med Lookup (Outpt)...

NNMC
Quick Order Examples

NNMC Guideline Driven Menu

Done

HEAD/ENT
- 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

Acute Sinusitis | Done

CLINICAL NOTES

~Most cases do NOT warrant antibiotic use
~Treat with nasal saline washes
~Consider antihistamines
~Consider antibiotics ONLY if:
~Fever
~Purulent nasal discharge
~Facial pain
~Symptoms > 10 Days

DO NOT USE

~Azithromycin
~TMP/SMX (Bactrim)

TREATMENT (Initial)

~FIRST LINE~
[ ] Nasal Saline 2 Sprays QID prn #45ml

~SECOND LINE~
[ ] Amoxicillin/Clavulanate (Augmentin) 500mg TID x 7 Days
~OR~
[ ] Amoxicillin/Clavulanate (Augmentin) 875mg BID x 7 Days

~PENICILLIN ALLERGY~
[ ] Doxycycline 100mg BID x 7 Days

TREATMENT (If no response OR Severe Sx OR Recent ABX

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

~SECOND LINE~
[ ] Levofloxacin 750mg Daily x 7 Days
~OR~
[ ] Levofloxacin 500mg Daily x 10 Days

NNMC
Quick Order Examples

IHS-EHR -- Shiprock Service Unit / DANIEL,NICHOLAS S PHARMD

Demo,Patient K
18 04-Jan-1942 (72) F

FAMILY MEDICINE 21-Sep-2014 17:41
DANIEL,NICHOLAS S PHARMD Ambulatory

Primary Care Team Unassigned

Active Orders (includes Pending & Recent Activity) - ALL SERVICES

Service	Order	Duration	Provider	Nurse	Clerk	Chart	Status
A/D/T	>> Admit to Med/Surg Specialty: FAMILY PRACTICE Admitting: KRESTEL,CLINT E RPH Attending: KRESTEL,CLINT PHARMD Diagnosis: test Condition: Poor	Start: 02/10/14 04:28	Langsam,D	EKS			active
A/D/T	>> Admit to Med/Surg Specialty: FAMILY PRACTICE OBSERVATION Admitting: HEISS,KATHERINE MD Attending: MICHAELS,SARA A MD Diagnosis: herniated disc Condition: Good	Start: 09/28/11 15:42				RRW	active
Nursing	>> LEVEL 1 NURSERY Admission Orders (>=37WKS) Admission: 1) Vital signs q30min until stable (to include one rectal temp & BP) q12h vital signs with nightly weights 2) q4h vital signs for 24hours for infants of GBS(+) mothers or if unknown 3) Initial recovery on open warmer. Move to open crib when Temp >98 deg. Use radiant warmer after bath. 4) Two ID bands and security band on all infants immediately after birth. 5) Plot infant OFC/Ht/Wt to find LGA/SGA status 6) Nursing physical exam within one hour of delivery. If heart murmur present - do 4 extremity BP with O2 saturation. Notify MD for O2 saturation <90%, abnormal BPs or cyanosis. 7) If infant born to a GDM/DM mother: Write "infant of GDM/DM mother" on admit sheet						active
Nursing	>> LEVEL 1 NURSERY Medication/Immunization Nursing Orders (>=37wks) 1) Erythromycin Ophthalmic Ointment 0.5% OU (or pharmacy equivalent) within 2 hours after birth 2) Aquamephyton 1mg IM x 1 within 2 hours after birth 3) Hepatitis B vaccine (5mcg/0.5ml -OR- 10mcg/0.5ml) IM x 1 prior to discharge (obtain parental consent) for all infants weighing 2000 grams or greater 4) If Hepatitis B status is unknown, notify MD and give Hepatitis B vaccine within 12 hours of birth after obtaining after obtaining parental consent 5) Notify MD if infant's mother is Hepatitis B positive						active
Nursing	>> LEVEL 1 NURSERY MD Notifications Notify MD for the following: 1) ROM >24hours 2) Foul smelling infant 3) Maternal fever or chorioamnionitis 4) Temperature >100.3 or <97 degrees 5) Respiratory Rate >60 or distress 6) Jaundice within 24 hours of birth 7) Heart Murmur 8) Mother positive for HIV/Hep B/Syphilis 9) Out of hospital delivery 10) Bilious emesis/abdominal distension 11) No UOP at 24hours 12) Other signs of illness	Start: 02/10/14 04:28	Langsam,D				active
	>> LEVEL 1 NURSERY Testing Nursing Orders (>=37wks) Perform the following tests: 1) Accu-check for:	Start: 02/10/14 04:28					

Acute Sinusitis

CLINICAL NOTES
~Most cases do NOT warrant antibiotic use
~Treat with nasal saline washes
~Consider antihistamines
~Consider antibiotics ONLY if:
~Fever
~Purulent nasal discharge
~Facial pain
~Symptoms > 10 Days

DO NOT USE
~Azithromycin
~TMP/SMX (Bactrim)

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~FIRST LINE~
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~SECOND LINE~
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~PENICILLIN ALLERGY~
[ ] Doxycycline 100mg BID x 7 Days

TREATMENT (If no response OR Severe Sx OR Recent ABX
~FIRST LINE~
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~OR~
[ ] Levofloxacin 500mg Daily x 10 Days

DANIEL,NICHOLAS S PHARMD | NAVSRA.D1.NA.IHS.GOV | NORTHERN NAVAJO MEDICAL CTR | 21-Sep-2014 17:57

NNMC
Quick Order Examples

NNMC Guideline Driven Menu

Done

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NNMC
Quick Order Examples

IHS-EHR -- Shiprock Service Unit / DANIEL,NICHOLAS S PHARMD

User Patient Refresh Patient Clear Patient Tools Help

Chart | Secure Email | SRSU Homepage | Useful Links | LabCorp | Broadcast | Webcident | Clinical Key | Dyna Med | Privacy

Demo,Patient K
18 04-Jan-1942 (72) F

FAMILY MEDICINE 21-Sep-2014 17:41
DANIEL,NICHOLAS S PHARMD Ambulatory

Primary Care Team Unassigned

PWH | Rx Ed | Postings CAD

Notifications | VS Entry/Triage | Coversheet | Appts | Vitals | Labs | Reports | Wellness+ | Peds | Meds | Orders | Dxs/Prob List | Services | RPMS Notes

File View Action Options

View Orders
Active Orders (includes

Write Orders
Delayed Orders
Outpt Peds Orders
Day Surgery Orders
Outpt Laboratory
Outpt Medications
Outpt Nursing
Consults
Radiology
Inpt Diet
Inpt IVF
Inpt Laboratory
Inpt Medications
Inpt Nursing
Inpt Respiratory
Inpt Adult Orders
Inpt Discharge Orders
Inpt Peds Orders
Inpt Newborn Orders
Nursing Freetext
Med Freetext (Outpt)
Med Freetext (Inpt)
Non NNMC Menus

Active Orders (includes Pending & Recent Activity) - ALL SERVICES

Service	Order	Duration	Provider	Nurse	Clerk	Chart	Status
A/D/T	>> Admit to Med/Surg Specialty: FAMILY PRACTICE Admitting: KRESTEL,CLINT E RPH Attending: KRESTEL,CLINT PHARMD Diagnosis: test Condition: Poor	Start: 02/10/14 04:28	Langsam,D	EKS			active
A/D/T	>> Admit to Med/Surg Specialty: FAMILY PRACTICE OBSERVATION Admitting: HEISS,KATHERINE MD Attending: MICHAELS,SARA A MD Diagnosis: herniated disc Condition: Good	Start: 09/28/11 15:42				RRW	active
Nursing	>> LEVEL 1 NURSERY Admission Orders (>=37WKS) Admission: 1) Vital signs q30min until stable (to include one rectal temp & BP) q12h vital signs with nightly weights 2) q4h vital signs for 24hours for infants of GBS(+) mothers or if unknown 3) Initial recovery on open warmer. Move to open crib when Temp >98 deg. Use radiant warmer after bath. 4) Two ID bands and security band on all infants immediately after birth. 5) Plot infant OFC/Ht/Wt to find LGA/SGA status 6) Nursing physical exam within one hour of delivery. If heart murmur present - do 4 extremity BP with O2 saturation. Notify MD for O2 saturation <90%, abnormal BPs or cyanosis. 7) If infant born to a GDM/DM mother: Write "infant of GDM/DM mother" on admit sheet						active
Nursing	>> LEVEL 1 NURSERY Medication/Immunization Nursing Orders (>=37wks) 1) Erythromycin Ophthalmic Ointment 0.5% OU (or pharmacy equivalent) within 2 hours after birth 2) Aquamephyton 1mg IM x 1 within 2 hours after birth 3) Hepatitis B vaccine (5mcg/0.5ml -OR- 10mcg/0.5ml) IM x 1 prior to discharge (obtain parental consent) for all infants weighing 2000 grams or greater 4) If Hepatitis B status is unknown, notify MD and give Hepatitis B vaccine within 12 hours of birth after obtaining after obtaining parental consent 5) Notify MD if infant's mother is Hepatitis B positive						active
Nursing	>> LEVEL 1 NURSERY MD Notifications Notify MD for the following: 1) ROM >24hours 2) Foul smelling infant 3) Maternal fever or chorioamnionitis 4) Temperature >100.3 or <97 degrees 5) Respiratory Rate >60 or distress 6) Jaundice within 24 hours of birth 7) Heart Murmur 8) Mother positive for HIV/Hep B/Syphilis 9) Out of hospital delivery 10) Bilious emesis/abdominal distension 11) No UOP at 24hours 12) Other signs of illness	Start: 02/10/14 04:28	Langsam,D				active
	>> LEVEL 1 NURSERY Testing Nursing Orders (>=37wks) Perform the following tests: 1) Accu-check for:	Start: 02/10/14 04:28					

Acute Bronchitis — Done

CLINICAL NOTES
~Antibiotics NOT indicated
~Obtains CXR to rule out pneumonia if:
~Unstable vitals signs
~Rales present on PE
~Cough >3 weeks duration

TREATMENT
~NONE
~Acceptance of no antibiotics better if called Chest Cold

Quick Notes: | POC Lab Entry | Wellness Handout | Patient Face Sheet | Brief Visit Summary | VistA Imaging (Rads, EKGs, & Scanned Documents) | Calculator | Chat

DANIEL,NICHOLAS S PHARMD | NAVSRA.D1.NA.IHS.GOV | NORTHERN NAVAJO MEDICAL CTR | 21-Sep-2014 17:56

Start | 5:57 PM 9/21/2014

NNMC Quick Orders

Cystitis

CLINICAL NOTES

~Uncomplicated:

~Female

~Premenopausal

~Not pregnant

~CONTROLLED Diabetic

~Consider testing for Chlmydia

~DO NOT treat asymptomatic bacteriuria

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

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

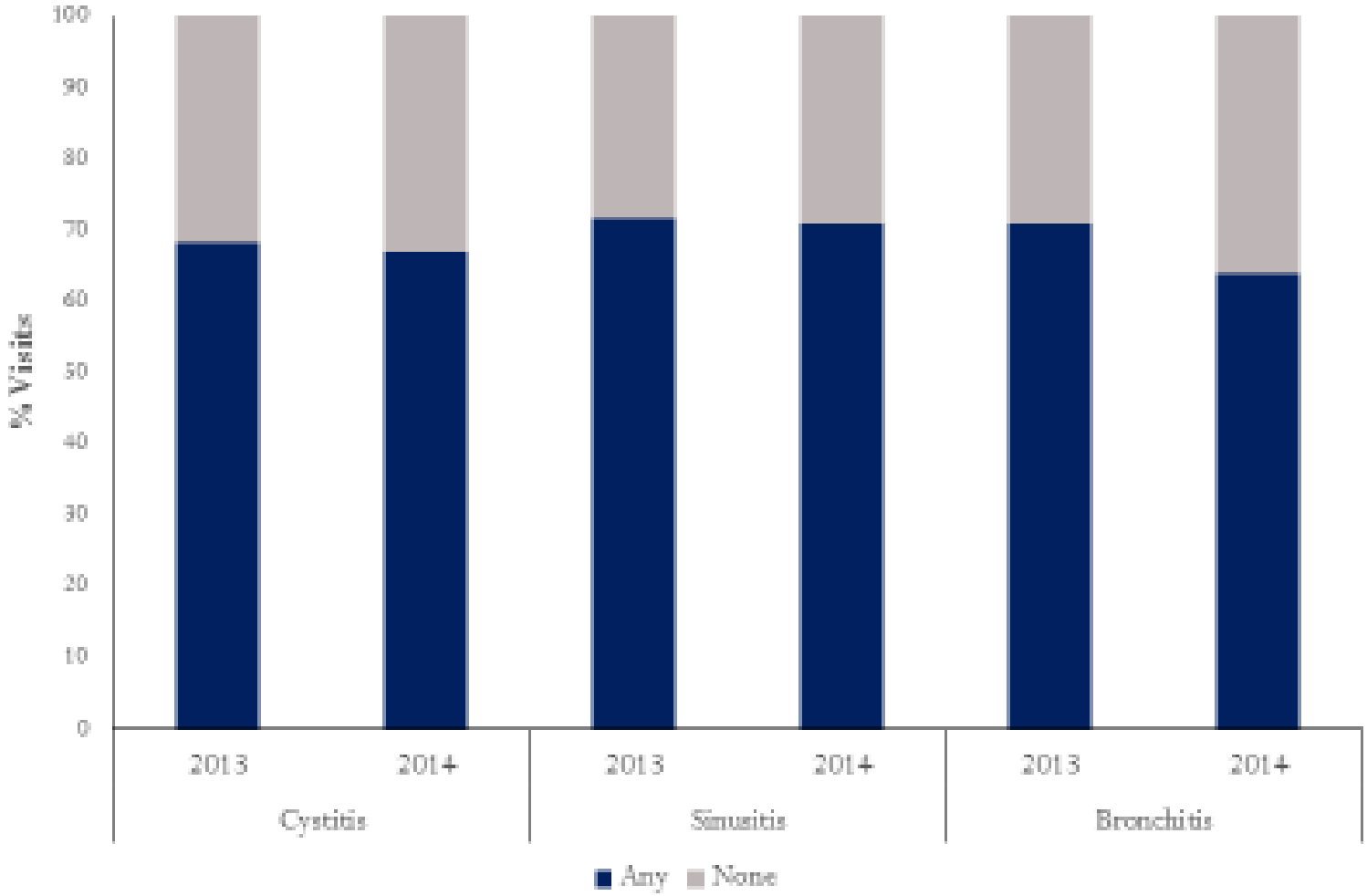
NNMC Prescribing Patterns Assessment: Methods

- 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

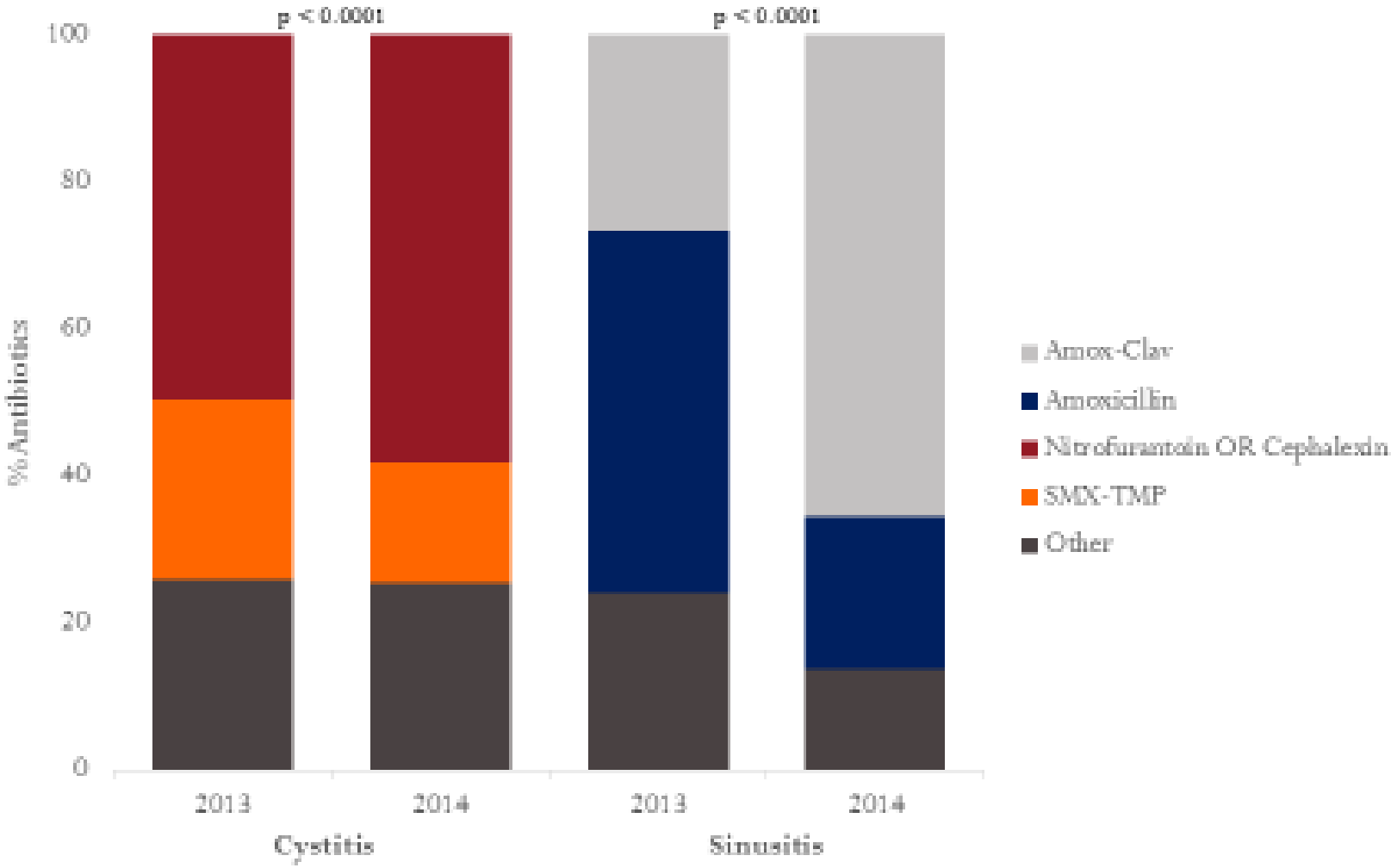
Results

	Patient Demographics					
	Cystitis		Sinusitis		Bronchitis	
	2013	2014	2013	2014	2013	2014
Total Visits	2948	3093	315	347	168	158
Total Patients	1909	1914	273	296	150	148
% Female	88.3	86.9	74.0	73.3	60.0	56.1
Median Age (yrs, range)	51 (18-100)	53 (18-99)	49 (18-85)	49 (18-90)	50 (18-89)	52 (18-96)
% ≥ 65 yrs old	26.7	25.5	12.5	13.5	22.7	32.4

Visits by Antibiotic Use



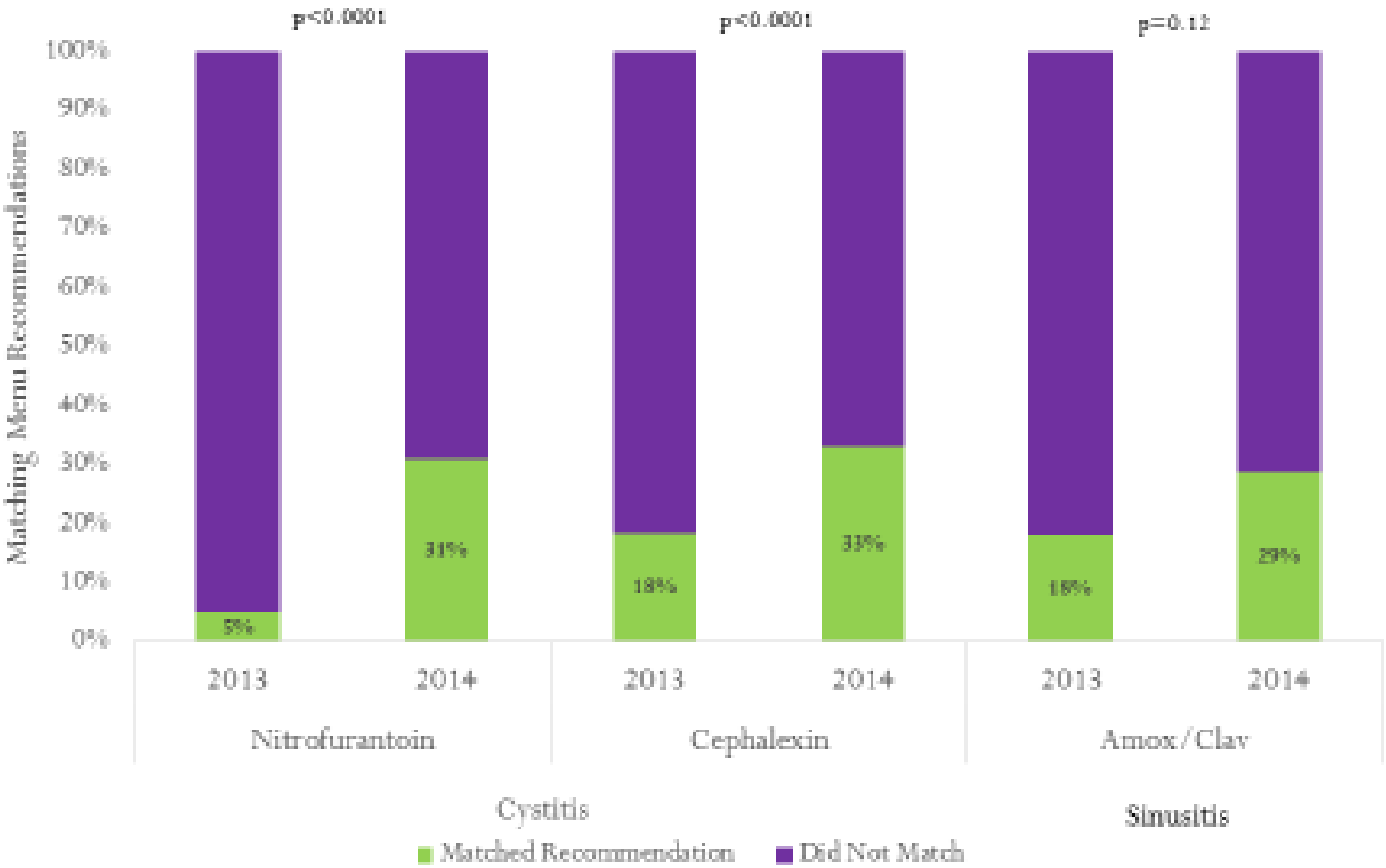
Antibiotic Use by Indication



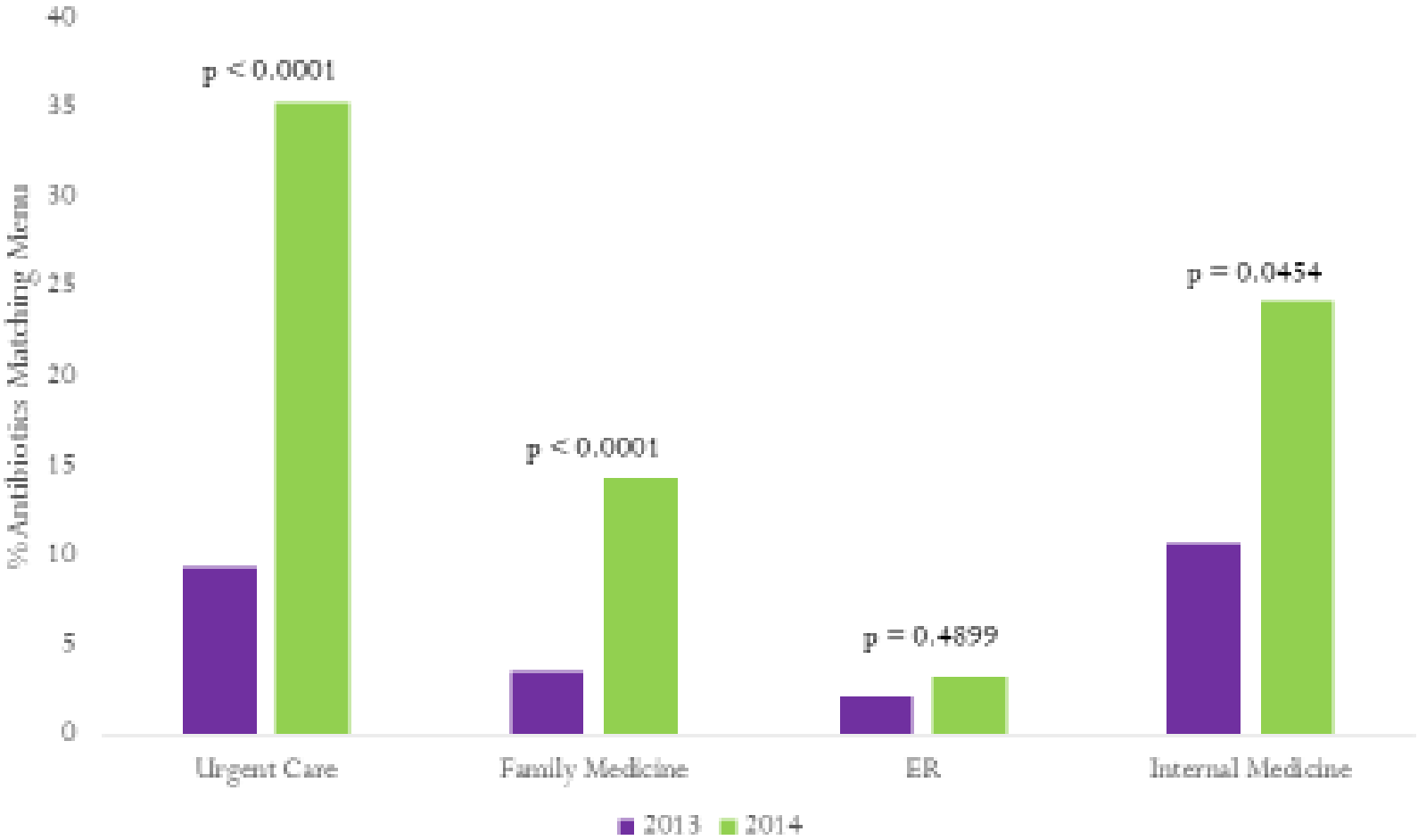
SMX-TMP = Sulfamethoxazole-Trimethoprim

*Nitrofurantoin menu-preferred
**Amoxicillin-Clavulanate menu-preferred

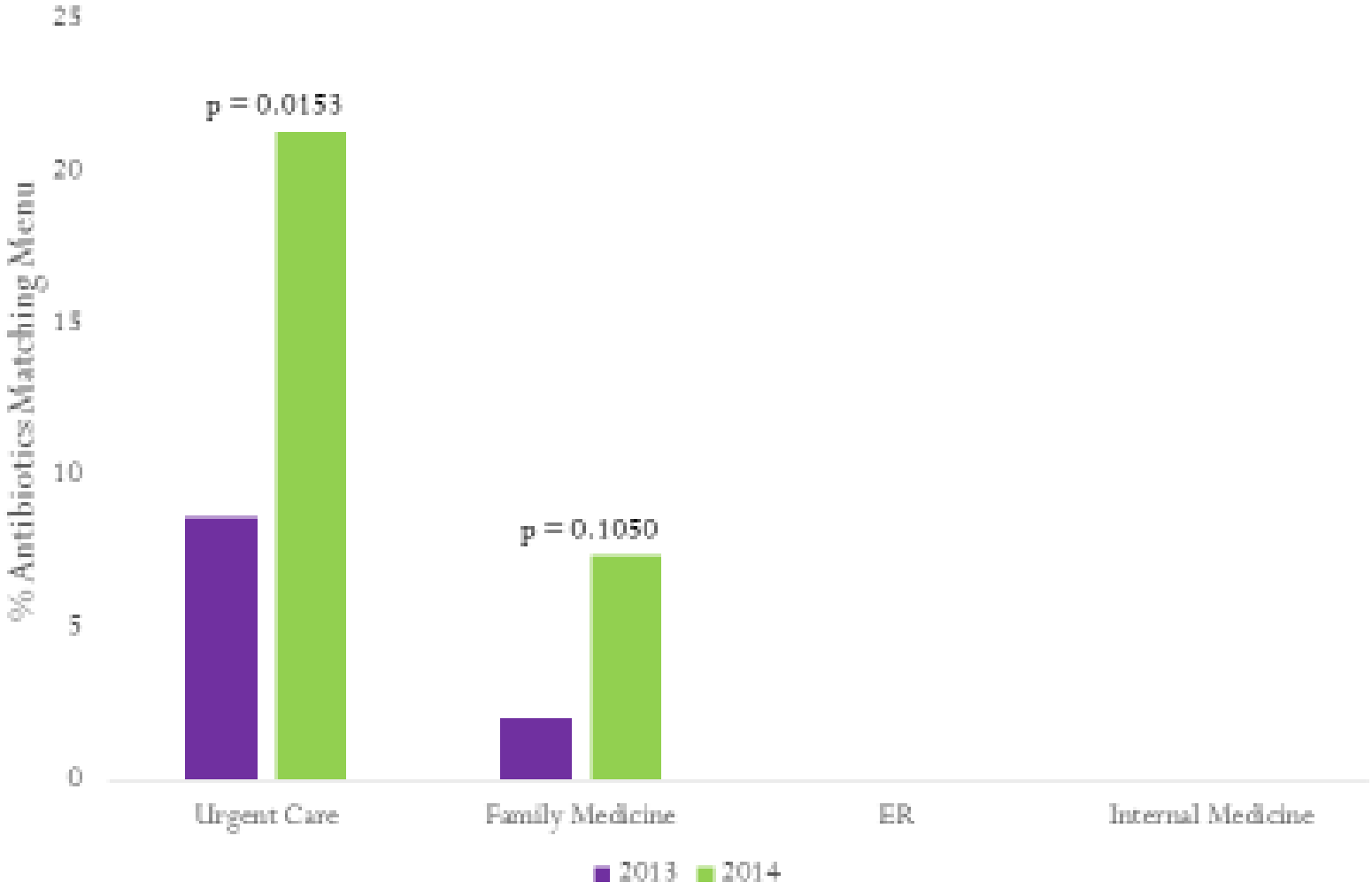
Changes in Antibiotic Dose and Duration



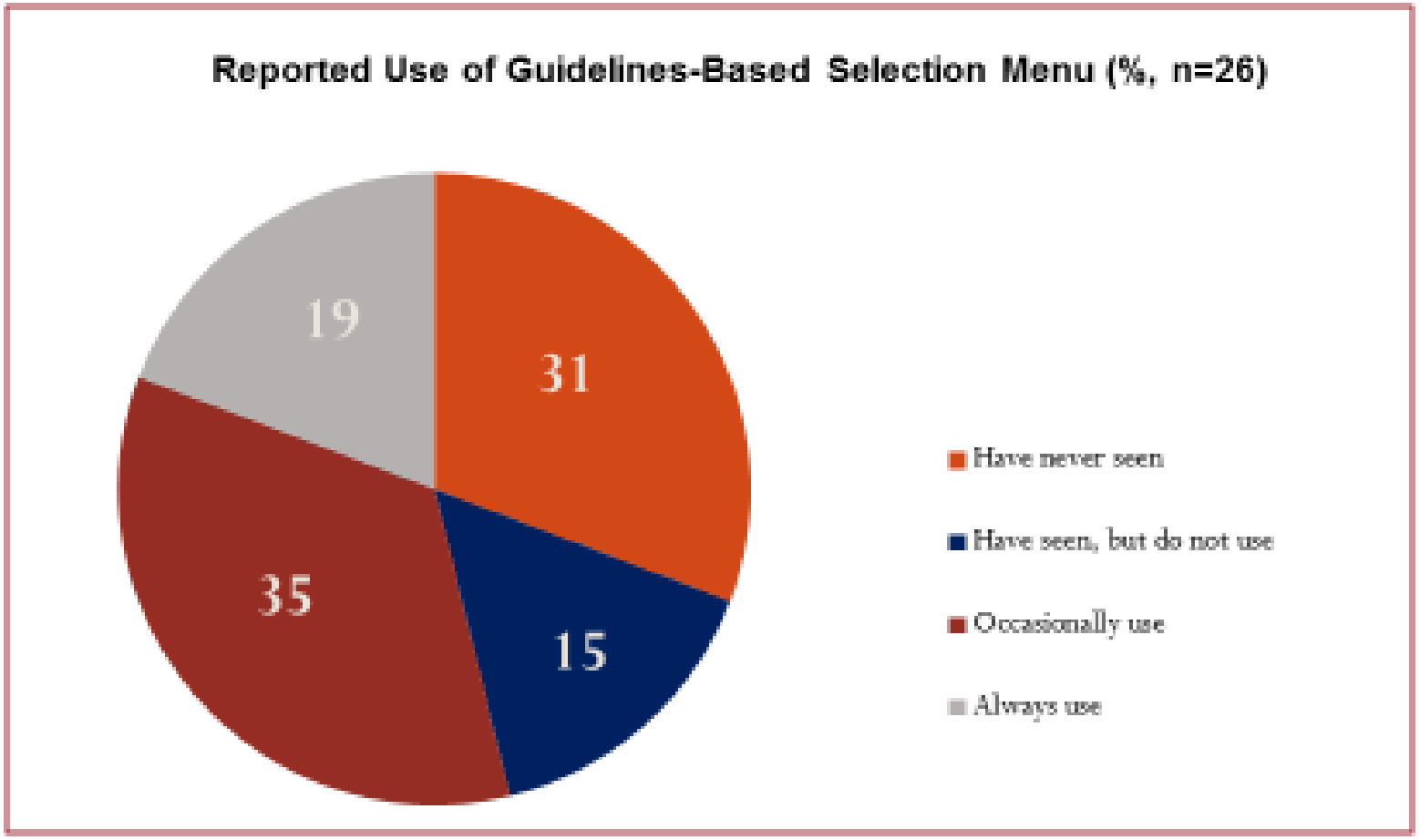
Antimicrobial Appropriateness by Hospital Location: Acute Cystitis



Antimicrobial Appropriateness by Hospital Location: Acute Sinusitis



Prescriber Survey



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

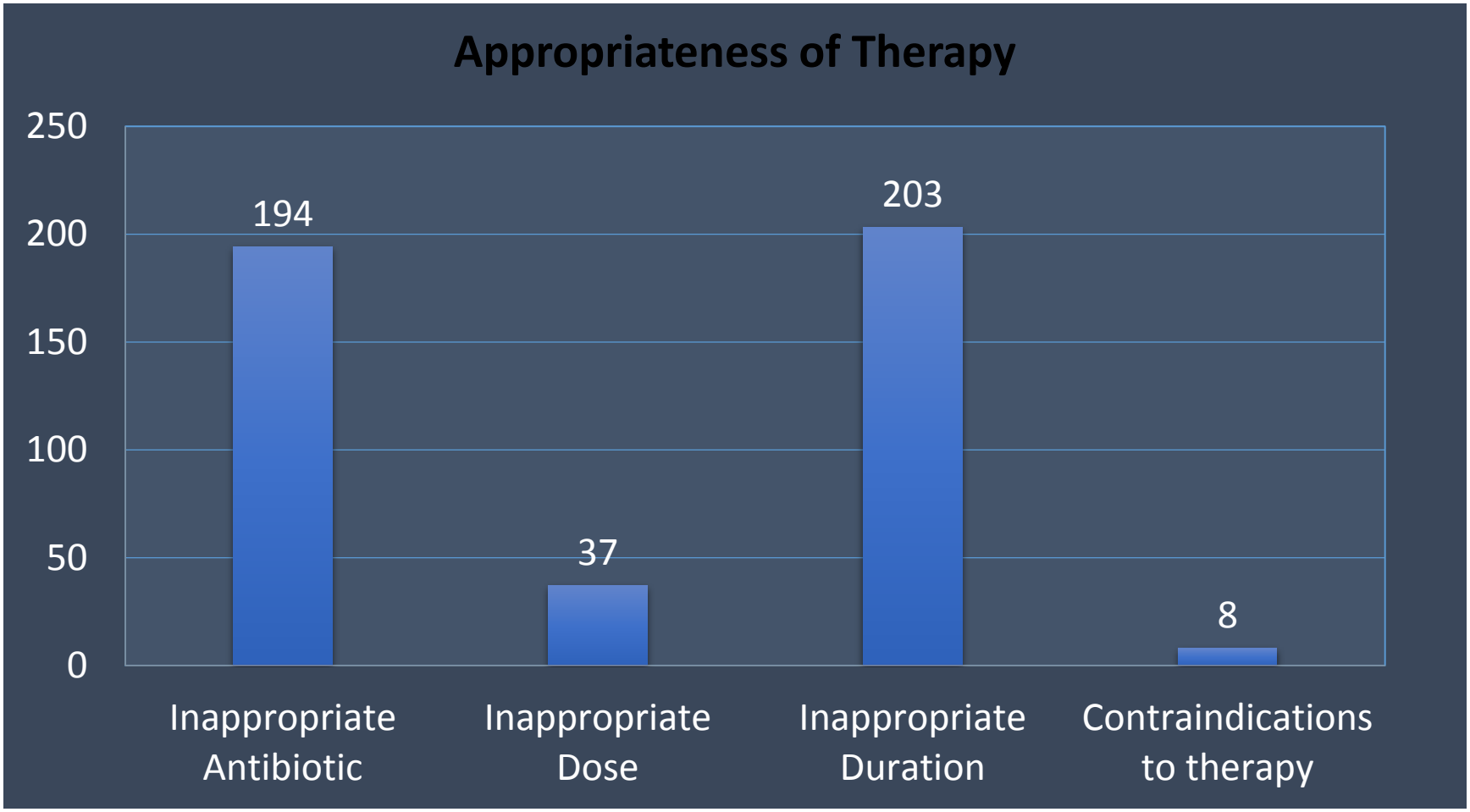
- Results of all C & S reports are recorded and analyzed
  - Prescriber
  - Infection site
  - Appropriateness of empiric therapy (including dose and duration)
  - Interventions outcomes—status of recommendation (accepted or rejected)
  - Aggregate data by prescriber is analyzed and included in Medical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

Red Lake Stewardship Initiatives

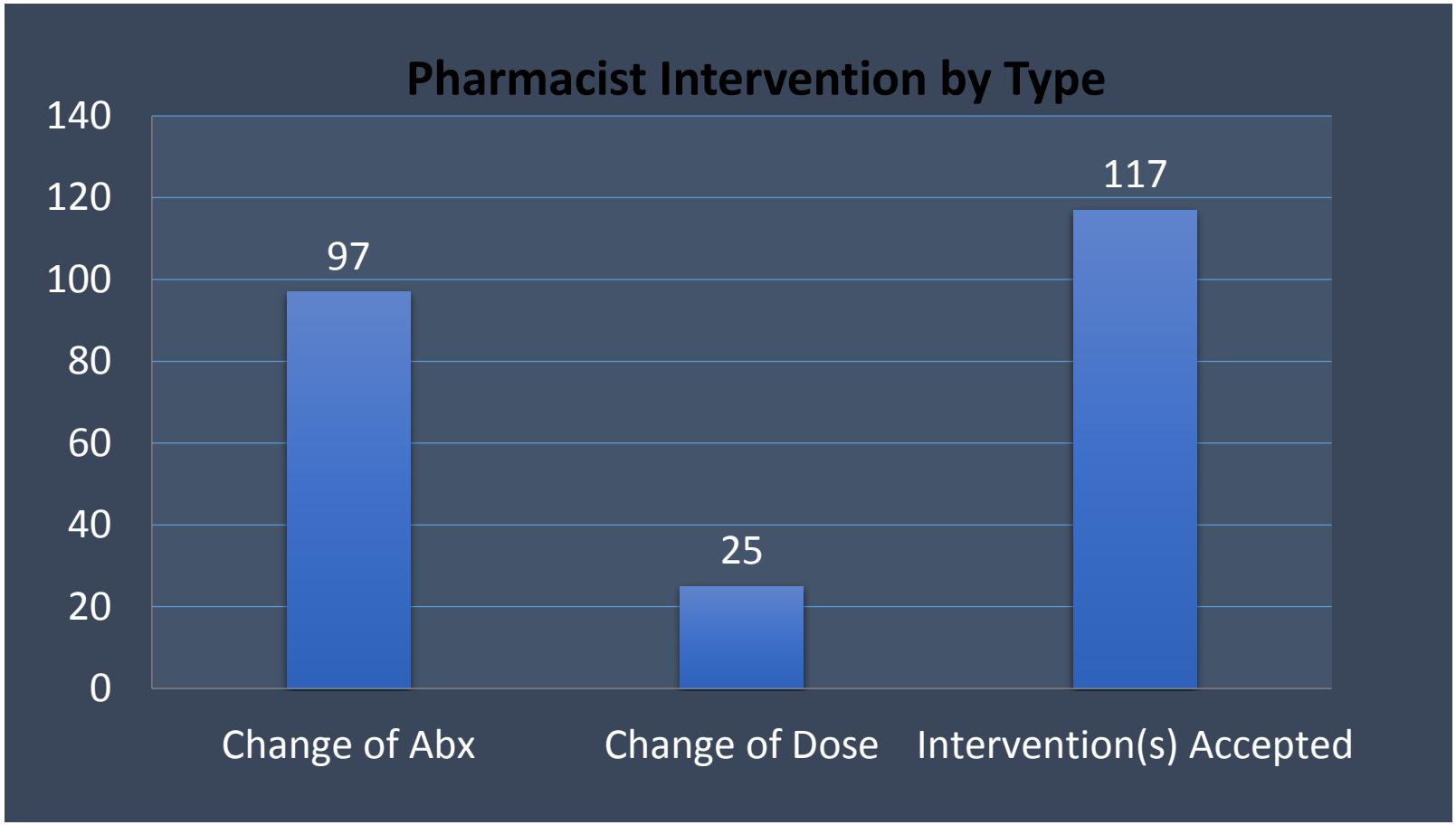
Patient Case Example:

- 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



Outcomes-Red Lake



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

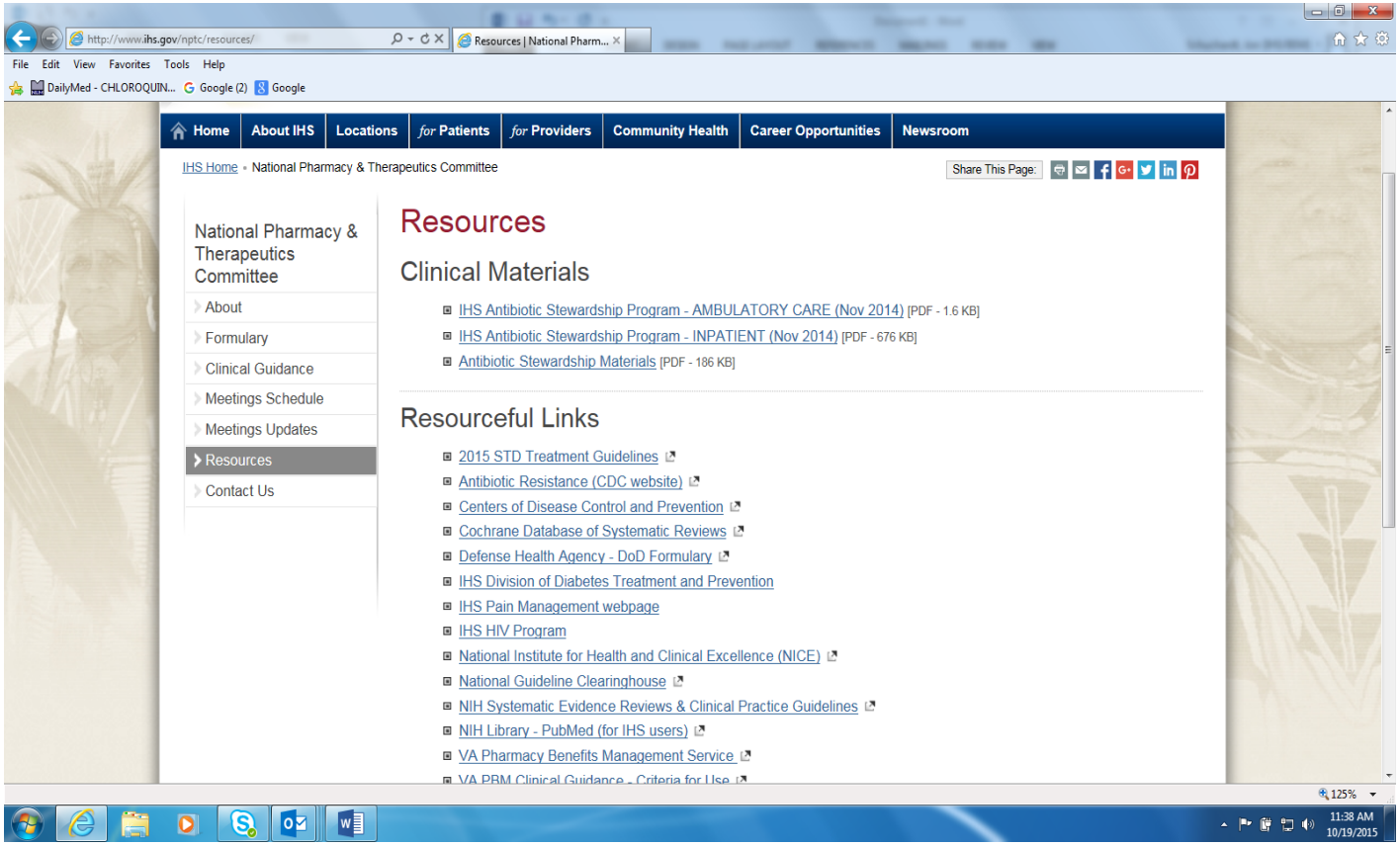
- Antibiotic resistance is a public health threat
- Tools to optimize antibiotic usage are needed
- Antibiotic stewardship does not have to be complex or costly
- Even small changes can have significant impact

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:**
  - **CDC: Get Smart http://www.cdc.gov/getsmart/community/index.html**
  - **National Association http://www.cdc.gov/getsmart/community/partners/current-partners.html**
  - **IDSA http://www.idsociety.org/stewardship_policy/**
- **Regional:**
  - **State ASP programs http://www.cdc.gov/getsmart/community/partners/current-partners.html**
- **Local:**
  - **Hospital/Health Systems**
  - **Public Health Departments**
  - **Laboratory services (Antibiogram)**

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