**Objectives**

- Illustrate the importance of an antibiotic stewardship program
- Demonstrate one of the stewardship initiatives that have been successfully implemented in Illinois.

**Disclosure Statement**

We have no commercial or financial conflict of interest

Many of the Antimicrobial Stewardship (AMS) activities described in this presentation were funded by the Centers for Disease Control and Prevention ELC 2012 ACA Cooperative Agreement.  
Opportunity Number: CDC-C10-101203PHF12
CDI Prevention Collaborative (2010-2011)
- 20 acute care hospitals
  ➔ focused on bundle of CDI prevention interventions

Illinois Campaign to Eliminate Clostridium difficile “ICE C. diff” (2011-2012)
- 120 acute care hospital
- 134 long term care facilities
- 23 sponsor organizations
  ➔ [http://www.idph.state.il.us/patientsafety/ice_home.htm](http://www.idph.state.il.us/patientsafety/ice_home.htm)

CDI Prevention Across the Continuum of Care “PACC” Collaborative (2013-2014)
- 4 acute care hospitals
- 11 long term care facilities
  ➔ Address issues specific to Long Term Care setting & transitions of care between acute & LTC

AMS Collaborative (2011-2012)
- 5 acute care hospitals

Illinois Summit on AMS (June 2013)
- Hospitals, Long Term Care facilities, and other stakeholders
- 250 participants
- 2nd Summit on Stewardship coming in March 2015!

AMS Webinars (co-hosted with Telligen)

Assessment of AMS in LTC
- web-based survey & site interviews (2013-2014)

Illinois Collaborative for Antimicrobial Stewardship Enhancement "ICHASE" (2013-2014)
- Acute care hospitals reporting antibiotic use to NHSN
- Focus on evaluating the implementation of guidelines
Illinois Antimicrobial Stewardship Collaborative

- Pre-collaborative surveys
  - “What” elements are in place?
- Qualitative on-site assessment to elicit input from multidisciplinary team members
  - More than “What” are you doing?
  - “How” does it work?
  - “Why” does it work (or not work)?
  - “What” do you need?
  - “Who” needs to be involved?
  - “Where” do you want to go?

- Large group meeting:
  - hospital administration, pharmacy, infectious disease, infection control, quality improvement, microbiology, information technology, nursing, and others

- Small focus groups:
  - Front line prescribers (n=28)
  - Pharmacists
  - AMS leadership (ID MDs & pharmacy leadership)
  - Various disciplines (micro, IT, nursing)

- Review of technical documents (e.g., antibiogram)

Illinois Antimicrobial Stewardship Collaborative

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The Illinois AMS Collaborative

ASSESSMENT TOOL EXCERPTS

- Please tell me a word, phrase, or sentence that comes to your mind when you hear the term “antimicrobial stewardship.”
Antimicrobial Stewardship is associated with:
• “Appropriate antimicrobial use”
• “Accountability, helping people understand that the decisions that they make impact more than just the patient in front of them.”
• “Critical to the survival of the antibiotic class.”
• “Necessity. It’s become incumbent on us to act.”
• “3 words: Monitoring, timing, and collaboration”

Antimicrobial Stewardship is associated with:
• “Balancing priorities.”
• “Money. I think about money.”
• “I think antibiotic stewardship is difficult”
• “Complicated and politically charged.”
• “Policing misuse… here come the cops!”
It is estimated that more than 50% of antibiotics are unnecessarily prescribed in office settings for upper respiratory infections (URIs) like cough and cold illness, most of which are caused by viruses.

More than half of all hospital patients receive an antibiotic & half of antibiotics prescribed in hospitals are not indicated.
Precious Drugs: We ♥ Antibiotics!

• Why are antimicrobials prescribed so frequently?
  • Customer service?
  • Physician anxiety?
  • ...do something!

Greatest Challenges:
• Timely communication to all prescribers
• Prescribers’ “fear to de-escalate therapies” when patients are improving
• Authoritative program that supports front-line pharmacists and other personnel interacting with prescribing clinicians
• Balance between autonomy of clinicians and implementing standard quality improvement measures

Illinois Antimicrobial Stewardship Collaborative
SUMMARY FINDINGS

Greatest Challenges:
• “Data. Data. Data.” (lack of)
• Competing IT priorities
• No clear metrics by which to evaluate success of antimicrobial stewardship programs
• Lack of benchmarking with other institutions
• Finding a common denominator
• Need for Guidelines that are clear and readily available
Mitigate the unintended consequences of antimicrobial use

- **Direct harms**
  - C. difficile & MDROs
  - Treatment failures
  - Adverse drug events, phlebitis

- **Indirect harms**
  - Increasing antimicrobial resistance
  - Increased colonization with MDROs
  - Excess costs

- **Regulatory burden**
  - Mandatory public reporting to CMS & IDPH

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**The Public Health Imperative**

[Image: http://www.cdc.gov/vitalsigns/antibiotic-prescribing-practices/]

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**DIRECT HARM**

Epidemiological Triad of C. diff Infection

[Image]
CRE "Nightmare bacteria"
- Few treatment options (if any)
- High mortality rate
- Spreading quickly

http://www.cdc.gov/drugresistance/threat-report-2013/

• Family of bacteria that include:
  - *Escherichia coli*
  - *Klebsiella* species
  - *Enterobacter* species
  - *Citrobacter* species

• Cause healthcare and community-associated infections
  - Example: urinary tract infections

Geographical Distribution of *Klebsiella pneumoniae* carbapenemase (KPC) Infections

States with KPC producing organisms

2001
Emergence and Rapid Regional Spread of KPC 
Social Network of Resistant Pathogens

KPC Outbreak Investigation
- 42 patients
- 14 acute care hospitals
- 4 cases acquired in acute care hospitals
- 2 LTACHs
- 24 cases linked to "LTACH A"
- 10 nursing homes
- 12 cases linked to 3 nursing homes
- 11 patients died or were discharged to hospice

**Illinois Situation Update**

Chicago area facilities (REALM project), 2010-2011

<table>
<thead>
<tr>
<th>Facility type</th>
<th>CRE colonization prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short stay acute care hospitals (adult ICUs)</td>
<td>3%</td>
</tr>
<tr>
<td>Long term acute care hospitals (LTACHs)</td>
<td>30%</td>
</tr>
</tbody>
</table>

Lin MY et al. CID, 2013

- CRE are relatively common in some Chicago healthcare facilities, particularly LTACHs
- Few prevalence data exist for hospital non-ICU wards, nursing homes, and regions outside of Chicago

**The Public Health Imperative**

**SCARY BUGS**

New-Delhi Metallo-β-Lactamase (NDM)

<table>
<thead>
<tr>
<th>Year</th>
<th>US Patients with NDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-2012</td>
<td>27</td>
</tr>
<tr>
<td>2013</td>
<td>67 (44 pts from Illinois)</td>
</tr>
</tbody>
</table>

MMWR 2014; 62(51): 1051

**SCARY BUGS**

CREs are emerging in Hawaii

- 2013 – 1 case
- 2014 – 1 case
- Both cases
  - confirmed to produce KPC
  - had complex medical histories
  - prolonged healthcare exposures, including care on the mainland
Mandatory reporting to the
Extensively Drug Resistant Organism registry
began November 1, 2013
Amendment to the Control of Communicable Diseases Code (77 Ill. Adm. Code 690) Rules

Why we must act now
• Antibiotics are a shared resource: The way antibiotics are used in one patient directly impacts how effective they are for another patient, or even for that same patient in the future.
• The more antibiotics are used, the more resistance proliferates; As antibiotic resistance increases, the effectiveness of the antibiotics we have decreases
• Development of new antibiotics has not kept pace with need for new agents.
Succinct way to market AMS aims
Addresses frontline clinician’s focus
  – What is the best way to treat infections that are common in my practice?
Provides further justification/rationale when requesting additional support/resources from leadership

– Does this patient have an infection or something else?
  • Empiric treatment for what? And for how long?
– Appropriate indication for antimicrobial therapy
  • Current treating physician may not have been the one to initiate therapy/lack of ownership for revising the drug regimen
– Diagnostic testing issues
  • Were cultures obtained appropriately?
Does this patient have an infection or something else?

- **Nurses’ role**
  - The “rights” of medication administration
    - Right patient, Right medication, Right dose, Right route, Right time, Right documentation
  - Right reason
    - Why is antimicrobial therapy indicated?
  - Right response
    - Monitor for adverse side effects, signs of CDI (diarrhea), and improvement or worsening of clinical symptoms, review & communicate lab results


- **Asymptomatic bacteriuria** is prevalent in
  - 25-50% of elderly women in LTC
  - 15-40% of elderly men in LTC


**Conceptual Framework**

**OPERATIONAL GOALS**

**Drug**
- For the diagnosis, the institution, AND for the patient
- Demonstrated effective per local epidemiology
- Safest
- Least “resistance-ogenic” – narrowest spectrum
- Least expensive

**Dose**
- Adjusted for size & renal function
- Pharmacy dosing programs (generally greater acceptance)
**Conceptual Framework**

**Operational Goals**

**Duration**
- Harms minimized by shortest effective duration
- Minimal duration undefined for many indications
- For most: resolution of systemic and improvement in local manifestations

**De-escalation**
- Change to narrowest-spectrum, least invasive, safest, lowest cost regimen when:
  - Justified by culture results (positive or negative)
  - Clinical improvement (e.g., IV to PO switch)
- Implement systematic way to ensure de-escalation is regularly evaluated & re-evaluated

**Antimicrobial Mindfulness**
- Umbrella concept for various methods employed to systematically assess and reassess the appropriateness of antimicrobial therapy
- Implement processes to review the 5 D's of Stewardship (Diagnosis, Drug, Dose, Duration, De-escalation)
• **Compelling rationale** & clear communication of purpose & goals: the 5 D’s
• **Authority**: Leadership support & clinician buy-in
• **Financial impact**: AMS interventions are revenue neutral or cost saving
• **Feasibility**: Availability of resources & practicality of implementation – impact on workflow
• **Feedback**: Monitor progress toward goals by reporting measures back (clinical outcomes, process measure, abx use)

---

• **Clinical outcomes**
  – Treatment success
  – Rates of *C. difficile*, MDROs, SSIs, & adverse reactions
• **Process measures** (monitor the 5 Ds)
  – Rates of misdiagnosis
  – Pharmacist/AMS reviews & intervention outcomes
  – Inappropriate therapy (complex, redundant, or inadequate drugs/doses)
  – Excessive duration or failure to de-escalate
• **Antimicrobial utilization & costs**
• **Antimicrobial susceptibility prevalence trends**
  – Hospital wide & targeted patient care areas
  – Key bug-drug susceptibilities emphasized

---

**The Heart of the Matter**

- **Institutional Guidelines**
- **Defining the 5 Ds**
- **Clinical information, teaching**
- **Explicit criteria for case review**
- **Basis for closed formulary**
Antimicrobial Stewardship
What you can do

• Prescribe antibiotics correctly & practice antimicrobial mindfulness
• Document the dose, duration, indication for every antibiotic prescription
• Stay aware of antimicrobial resistance patterns in your practice & community
• Participate in and lead efforts in your practice to improve prescribing practices
• Follow hand hygiene and other infection control measures with every patient
• Educate patients and families about appropriate antibiotic use

How do we start the process of improvement?

• Build on past successes
  – HAI prevention efforts often “grow” as an extension of previous prevention efforts
    • Expansion from acute to long term care settings
    • C. diff → antimicrobial stewardship → CRE
• Do what’s feasible
  – Many small steps still get you closer to achieving your goals
• Sustainability
  – Build changes into the workflow
  – Engagement of partners & coordination of efforts

The Institute for Healthcare Improvement (IHI)
Model for Improvement

- Shared goal
- Measures to track progress/success (Process, Outcome)
- Bundle interventions & innovations
- Multidisciplinary teams

Plan
Do
Study
Act

Start with a small test of change... Then, build on and expand your efforts.

Start with a small test of change...

### Objectives

1. State the primary goal of antimicrobial stewardship.

2. List alternate personnel who may be recruited to fulfill the roles of Infectious Diseases (ID)-trained physicians and pharmacists to spearhead antimicrobial stewardship initiatives.

3. State how application of each of the 5Ds is relevant to meeting the primary goal of antimicrobial stewardship.

**Primary goal:**

Optimize clinical outcomes while minimizing unintended consequences of antimicrobial use, including:

- toxicity
- the selection of pathogenic organisms (such as *Clostridium difficile*)
- and the emergence of resistance.

How can you (or colleagues) help to advance the goal of antimicrobial stewardship at your practice site?

Antimicrobial Stewardship Team:
- Development & dissemination of local Consensus Guideline
- Data driven
- "Living document"
- Back-up (usually MD) for frontline AMS staff
- Share findings with prescribers, frontline ASP staff

Front line stewardship staff:
- RPh, MD, RN, Physician Assistant, Infection Preventionist, Nurse
- Microbiology
- Infection Control
- Department Managers support frontline staff

Objectives

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2. List alternate personnel who may be recruited to fulfill the roles of Infectious Diseases (ID)-trained physicians and pharmacists to spearhead antimicrobial stewardship initiatives.

3. State how application of each of the 5Ds is relevant to meeting the goal of antimicrobial stewardship.
Many (52-61%) lead initiatives in practice guidelines and quality improvement

83% of hospitals with >200 Beds have hospital medicine programs*

• Don’t be afraid to start a "less than perfect" stewardship program
• Start small, build upon successes
• Adapt stewardship initiatives to available resources

_Hosp Pharm_ 2010; 45(suppl 1):S10.
No single measure can provide a complete picture of the potential effect (including clinical outcome) of a stewardship program.

Process measures:
- Number & type of interventions
  - Specific 5Ds (diagnosis, drug, dose, etc)
- Proportion of accepted interventions
- Guideline compliance

Outcomes:
- Antimicrobial consumption
- Resistance
- Patient outcomes
  - C. difficile infection
  - Adverse drug events (patient safety)
  - Length of stay
  - Readmission
  - Mortality
  - Cost

Measuring the Progress of stewardship initiatives...key to Sustaining Programs

No single measure can provide a complete picture of the potential effect (including clinical outcome) of a stewardship program.
National Healthcare Safety Network (NHSN) 
Antimicrobial use and resistance (AUR) module

Facility data

Antimicrobial use   Microbiology

*NElectronic data transfer

NHSN

Inter- and intra-facility benchmarking

*Coordinate with software providers of electronic health record.

Prospective Audit & Feedback (RPh / MD) 
Critically ill patients, over 1 year...

247 suggestions (34%) of 717 cases reviewed

<table>
<thead>
<tr>
<th>Suggestion</th>
<th>Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop abx (56%)</td>
<td>81%</td>
</tr>
<tr>
<td>Change abx (26%)</td>
<td>84%</td>
</tr>
<tr>
<td>Other (18%)</td>
<td>84%</td>
</tr>
</tbody>
</table>

Outcomes

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotic days</td>
<td>↓22%</td>
</tr>
<tr>
<td>C. difficile infection</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>↑33%</td>
</tr>
<tr>
<td>Abx expenditures</td>
<td>↓24%</td>
</tr>
<tr>
<td>($95,000)</td>
<td></td>
</tr>
<tr>
<td>Crude mortality</td>
<td>↔</td>
</tr>
<tr>
<td>Length of stay</td>
<td>↔</td>
</tr>
</tbody>
</table>


Success!

Securing support after 1 year...

• 1 FTE stewardship pharmacist
• 0.5 FTE pharmacy fellow
• 0.5 FTE ID physician
• 0.1 FTE database analyst
• Expanding stewardship initiatives to medical and surgical units

Elligsen. JCPH 2012: 65:31
1. State the primary goal of antimicrobial stewardship.

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3. State how application of each of the 5Ds is relevant to meeting the goal of antimicrobial stewardship.

- Infrequently addressed outcome in the literature ...but,

- 28-43% of ASP interventions are to stop antibiotics in response to negative cultures, or an alternate diagnosis.


• Pneumonia
  - Oftentimes associated with unnecessary use of antimicrobials

• Skin & soft tissue infection
  - Unnecessarily broad-spectrum therapy

• Asymptomatic bacteriuria
  - Prolonged treatment duration
Right Drug...the first time (empiric therapy)

Lower mortality with adequate initial (empiric – best guess) regimen


Right Dose (dose optimization)

Piperacillin-Tazobactam for Pseudomonas aeruginosa Infections: Clinical Implications of an Extended Infusion Dosing Strategy

APACHE II score ≥17*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14 day mortality</td>
<td>32%</td>
<td>12%</td>
</tr>
<tr>
<td>P</td>
<td>P=.04</td>
<td></td>
</tr>
<tr>
<td>Length of stay, (median) days</td>
<td>38</td>
<td>21</td>
</tr>
<tr>
<td>P</td>
<td>P=.02</td>
<td></td>
</tr>
</tbody>
</table>

*No difference in less critically ill patients APACHE II score <17.


Right De-escalation

Broader Spectrum = Greater “Collateral Damage”

• Clostridium difficile risk highest from 3rd generation cephalosporins, fluoroquinolones, clindamycin1,2,3

Antimicrobial Optimization Reduces *C. difficile* Infection

Right De-escalation

Averted IV catheter days & associated complications

<table>
<thead>
<tr>
<th>peripherally inserted central catheters (PICC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 2. Reasons for OPAT denial</td>
</tr>
<tr>
<td>Reason for denial of OPAT</td>
</tr>
<tr>
<td>Oral regimen suitable for infection and/or organism</td>
</tr>
<tr>
<td>based on culture results</td>
</tr>
<tr>
<td>Oral regimen suitable for infection and likely infecting</td>
</tr>
<tr>
<td>organisms (no culture data available)</td>
</tr>
<tr>
<td>Additional antibiotic therapy not necessary</td>
</tr>
</tbody>
</table>

*OPAT = Outpatient antibiotic therapy program. Overall cure: 49 (87.5%)

Conant. *J Antimicrob Chemother* 2014; 69:1695

Right De-escalation (IV/PO)

Comparison of 8 vs 15 Days of Antibiotic Therapy for Ventilator-Associated Pneumonia in Adults

A Randomized Trial

<table>
<thead>
<tr>
<th></th>
<th>15 days</th>
<th>8 days*</th>
<th>difference, 1.6%; 90% confidence interval [CI], −3.7% to 6.9%</th>
<th>difference, 2.9%; 90% CI, −3.2% to 9.1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>19%</td>
<td>17%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrent infection</td>
<td>30%</td>
<td>26%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-drug resistant pathogen in the setting of recurrence</td>
<td>42%</td>
<td>62%</td>
<td>P = 0.04</td>
<td></td>
</tr>
</tbody>
</table>

*Except for infections caused by selected pathogens, e.g., *P. aeruginosa*, *Acinetobacter* species. Chastre. *JAMA* 2003; 290:2588.
Growing evidence that stewardship improves patient outcomes
– More data needed to sustain/justify programs

Empower front-line staff with the tools to change prescribing practices to advance the goal of antimicrobial stewardship

**Summary**

*Making stewardship happen*

• Growing evidence that stewardship improves patient outcomes
  – More data needed to sustain/justify programs

• Empower front-line staff with the tools to change prescribing practices to advance the goal of antimicrobial stewardship

**Why Stewardship: Provider Perspective**

• Triple Aim Approach:
  – Patient satisfaction including quality of care and outcomes
  – Decrease costs
  – Improve population health

• Antibiotic misuse adversely impacts the patient directly and eventually society as a whole
  – Antibiotic use increases risk for resistant bacteria
  – Fewer antibiotic choices for the community as a whole

Figure taken from: [http://www.ihi.org/engage/initiatives/TripleAim/Pages/default.aspx](http://www.ihi.org/engage/initiatives/TripleAim/Pages/default.aspx)

• Stewardship aims to improve antibiotic use
  – Improve patient satisfaction and outcomes
  – Improve quality of patient care
  – Decrease costs
  – Improve the health of the community

• Bonus:
  – Educational Opportunities
    • Antibiotics are used by a wide variety of medical professionals
    • Education for patient and patient’s family
Antibiotic Use Begets Resistance in the Population and the Person

- Adjusted hazard ratios for development of specific resistance pattern after prior use:
  - Fluoroquinolones: 4.0
  - 3rd-generation cephalosporins: 3.5
  - Ampicillin-sulbactam: 2.3
  - Imipenem: 5.7


Role of Clinician

- Does not have to be “ID” physician
  - Hospitalist, Internist, Family Medicine, etc
- Key role in leadership, development and implementation of stewardship team and initiatives
- Back up for Pharmacist and all others on stewardship team

Our Stewardship

1. Family Medicine Teaching Service Intervention
   - Family Medicine Service on General Med/Surg Floor
   - Treatment of diabetic foot infections
2. Pharmacist Driven Stewardship Intervention
   - Surgical ICU, Neurosurgical ICU, General Medical/Surgical Floors
ONGOING AMS Activities

3. Institutional Guidelines
4. Antibiotics on 7th Hospital Day Review
5. Bacteremia Surveillance
6. Outpatient Antibiotic Treatment Program (OPAT): requires ID Consult for Long Term IV Antibiotics
7. MICU antibiotic educational intervention

Our Stewardship:

Family Medicine Teaching Service (FMS)

Pre-Intervention Phase:

- Retrospective chart review of FMS antibiotic recipients to evaluate for antibiotic appropriateness
  - Opportunities for Antibiotic Improvement
    - Based on clinical judgment & ID Tx guidelines (Local)
    - Characterize these opportunities
  - Survey on antibiotic prescriber comfort for attendings, residents and pharmacists rounding with FMS

Family Medicine Teaching Service (FMS)

Retrospective Treatment Indications on Family Medicine Service
Intervention:
- Presented data gathered on Retrospective reviews
- Diabetic foot infection (DFI) treatment picked as area of focus based on retrospective review
- Teaching session on the treatment of DFI
  - Based on Stroger Infectious Disease Treatment Guidelines and culture based data collected during previous projects

Our Stewardship: Family Medicine Teaching Service (FMS)

- Prospective post-prescriptive reviews of all antibiotic recipients on FMS
- Provide immediate feedback to the treating service on opportunities for improvement

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Pre</th>
<th>Post</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>11</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>Empiric AM - too narrow</td>
<td>3 (27)</td>
<td>6 (21)</td>
<td>3 (38)</td>
</tr>
<tr>
<td>Empiric AM - too broad</td>
<td>7 (64)</td>
<td>6 (21)</td>
<td>3 (38)</td>
</tr>
<tr>
<td>Empiric AM - appropriate</td>
<td>1 (9)</td>
<td>1 (3)</td>
<td>2 (25)</td>
</tr>
<tr>
<td>ID consult recommended</td>
<td>NA</td>
<td>15 (100)</td>
<td>6 (63)</td>
</tr>
<tr>
<td>De-escalate AM</td>
<td>0</td>
<td>8 (28)</td>
<td>2 (25)</td>
</tr>
<tr>
<td>Recommendation accepted</td>
<td>NA</td>
<td>15 (100)</td>
<td>6 (63)</td>
</tr>
</tbody>
</table>

| SSTI             | 9    | 5    | 3       |
| Empiric AM - too narrow | 4 (44) | 2 (40) | 1 (33) |
| Empiric AM - too broad | 2 (22) | 1 (20) | 2 (67) |
| Empiric AM - appropriate | 2 (22) | 2 (40) | 0       |
| ID consult recommended | 10 | 4 (100) | 2 (67) |
| De-escalate AM | 2 (22) | 1 (20) | 2 (67) |
| Recommendation accepted | NA | 14 (100) | 2 (67) |

Total Cases: 20, 24, 11
Our Stewardship #2: Pharmacist Led Intervention

• 3 Floor Pharmacists
  • Round with various service teams & flag charts with possible opportunities for antibiotic improvement
    – Pharmacist
      1. Makes recommendations during team rounds
      2. OR Calls Gail or Becca to discuss case and then makes recommendation/s to the appropriate team
    – Gail Itokazu or Becca Peglow review all flagged chart for appropriateness of recommendations

Our Stewardship #2: Pharmacist Led Intervention

• SICU/NSICU Pharmacist (intervention start March 2014)
  • SICU = 14 bed unit; NSICU= 10 bed unit
    – 52 interventions
      • Dosing/kinetics (Vanco); Duration of antibiotics; Indication; De-escalation; ID consultation
    – 81% (42/52) acceptance of recommendations
      • Pharmacist makes recommendations directly to team during rounds
      • Reasons for rejection are usually due to unclear diagnosis/treatment indication and duration
      • MD calls team if Pharmacist recs are appropriate but rejected

Our Stewardship #2: Pharmacist Led Intervention

• Main impact seen in SICU/NSICU where Pharmacist has smaller service
• Floor Pharmacists cover multiple busy services
  – Less time dedicated, but over time picked up
• Important to have a presence in the hospital
  – Relationships with various services and administrators cannot be over emphasized
• Clinical Pharmacists are ALREADY doing a lot of this, now we are documenting the work
• Barriers are particular services
  – Working with various services to break down barriers and educate about stewardship
• Continued success requires appropriate resources
  – Pharmacists, Physicians, IT support
  – primary services buy in to stewardship
• Won’t happen overnight
  – Ongoing efforts, education and intervention

American Hospital Association Antimicrobial Stewardship Toolkit
http://www.ahaphysicianforum.org/resources/appropriate-use/antimicrobial/ASP-Toolkit.pdf