Will You Be Compliant with the Antibiotic Stewardship Program Requirements by 2020?
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Learning Objectives
1. List the core elements defined by the CDC for an antimicrobial stewardship program
2. Discuss strategies to become compliant with the 2020 antimicrobial stewardship program requirements
3. Identify implementation barriers of an antimicrobial stewardship program that are unique to institutions of various sizes
4. List opportunities for developing stewardship programs in the ambulatory care setting

RAT DEAL? RAD LATE?
1. Leadership Commitment: Dedicating necessary human, financial and information technology resources.
2. Accountability: Appointing a single leader (MD preferred) responsible for program outcomes.
3. Drug Expertise: Appointing a single pharmacist leader responsible for working to improve antibiotic use.
4. Action: Implementing at least one recommended action, such as 48-hour “time-out”
5. Tracking: Monitoring antibiotic prescribing and resistance patterns.
6. Reporting: Regular reporting information on antibiotic use and resistance to relevant staff.
7. Education: Educating clinicians about resistance and optimal prescribing.

JC, CMS...
1. Joint Commission: New antimicrobial stewardship standard effective January 1, 2017 for critical access hospitals
   - Largely reflects CDC elements, with some specific quirks
     - Education expanded to include patients and families (see link to CDC handout)
     - Education for all staff involved in antimicrobial ordering, dispensing, administration, and monitoring
     - Institution has “organization-approved multidisciplinary protocols”
     - “Institution takes action on improvement opportunities identified” by its program
   - Institution has “evidence-based use of antibiotic” throughout institution
   - “Demonstrates sustained improvements in proper antibiotic use”
   - “Ensures adherence to national guidelines”

Current Status of Implementation

Large Academic Institutions

- Most large academic institutions already have a stewardship program
  - Precise numbers hard to come by (up to 90%??); what is the definition?
  - Doren Clin Ther 2013: Having a program was associated with:
    - Having an ID consult service, an ID fellowship program, and an ID pharmacist
    - > 500 beds and >10,000 annual admissions
    - Being a teaching hospital
  - Publishing an antibiotic
- Simply meeting the standards likely doesn’t present a monumental effort from present day
  - Major UM gap analysis deficiency: Education of "all staff" and patients (JC)

UM Antimicrobial Management Program

- Established 1997 (Vanco restriction, IV->PO, renal dosing) -> restricting broad-spectrum agents
- 2 ID clinical pharmacists intervened to limit inappropriate use of broad-spectrum ATB
  - Ceftazidime used decreased by 44%
  - Carbapenem use decreased by 20%
  - i.e., "traditional" stewardship

Current Program

- Antimicrobial Budget: ~$7 million
- Infectious Diseases (ID) Consult Service
  - 6 teams: 5 adult, 1 pediatric
  - ~20 ID attending physicians, 6-8 fellows
- Antimicrobial Stewardship Team
  - 3 adult (2.8 FTEs) + 2 pediatric (1.5 FTEs) ID pharmacists + PGY-2 ID resident
  - Adult and Pediatric ID MD directors + 2 adult ID MD members
- Have implemented initiatives that have optimized care, conserved resources, decreased length of stay, readmissions, and mortality

The Challenge is Significant

- Inpatient ATB use 2006-2012 for ~400 hospitals
  - ~55% of patients received ≥1 ATB dose during stay
    - National DOT/1,000 patient days: 755 (UM 826)
    - Use did not significantly change over time
      - PIs only class 100 (120); UM 50, but 40% of use inappropriate
  - Vancomycin SB

<table>
<thead>
<tr>
<th>Type of Hospital</th>
<th>DOTs/1,000 patient days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching</td>
<td>730</td>
</tr>
<tr>
<td>Non-teaching</td>
<td>780</td>
</tr>
<tr>
<td>Large, urban, teaching</td>
<td>721</td>
</tr>
</tbody>
</table>
- Only ~22% of empiric antibiotics are narrowed or discontinued by Day 5 (Braykov et al. Lancet ID 2014)

Guidelines NEED to Consider Stewardship!

- New guidelines (11 years later) have abandoned initial "HCAP" definition

But Drug Based Stewardship Should Remain Priority #1

- Develop tools and materials to promote appropriate antimicrobial prescribing and quality improvement activities
- Develop tools and reference materials to promote appropriate antimicrobial therapy
- Implement methods to improve management of infectious diseases
- Improve publicly reported quality performance measures and outcomes measures

Develop Tools and Materials to Promote Appropriate Antimicrobial Prescribing and Quality Improvement Activities

- Prior approval
- Criteria restricted
- Restricted drug list
- HIV
- Candidemia
- S. aureus bacteremia
- C. difficile colitis
- Pneumonia
- Multi-drug resistant organisms

Micro-Based Stewardship
Guidelines NEED to Consider Stewardship!

Some get it….


ANTIMICROBIAL STEWARDSHIP in the COMMUNITY HOSPITAL

D. Scott BS PharmD
Clinical Specialist Adult Infectious Disease
Spectrum Health

The speaker has no relevant financial or nonfinancial relationships to disclose

ANTIMICROBIAL STEWARDSHIP in the COMMUNITY HOSPITAL

My goal: To provide you with the tools necessary for compliance with pending TJC and CMS requirements

ANTIMICROBIAL STEWARDSHIP AT SPECTRUM HEALTH

Adult and Pediatric Antimicrobial Stewardship Programs (ASP) at Butterworth and Helen DeVos Children’s Hospital implemented 2014

We are in the process of expanding our ASP to 9 regional Community Hospitals in West Michigan

REQUIRED READING

- The Joint Commission
  - http://www.jcrinc.com

- CDC

- Centers for Medicare and Medicaid Services (CMS)

REQUIRED READING – ASP MENU

- Antibiotic Stewardship Driver Diagram and Change Package

Introduction
Prepared by the Institute for Healthcare Improvement (IHI) Preformed for the Centers for Disease Control and Prevention (CDC) A Framework to Reduce Inappropriate Antibiotic Utilization in Hospitals The Centers for Disease Control and Prevention (CDC) and the Institute for Healthcare Improvement (IHI) partnered in an effort to develop this conceptual model of key drivers for reducing inappropriate antibiotic utilization. Centers experts developed the framework to assist hospitals in understanding and improving the necessity and ease of implementation in all hospitals.
COMMUNITY HOSPITAL STEWARDSHIP
THE FOUNDATION

- Multidisciplinary local leadership commitment (Pharmacy Department, Hospital Administration, Medical Staff, IT, Infection Prevention and Microbiology Lab) dedicating necessary human, financial and information technology resources

- A written policy
  - Supported by standard work (see IHI/CDC ASP menu)

COMMUNITY HOSPITAL STEWARDSHIP
THE TEAM

- Local designated leader (physician preferred) responsible for program outcomes
- Essential local support staff
  - Pharmacist(s)
  - Hospital physician(s)
  - Engage with local
  - Infection Prevention
  - Microbiology Lab
  - Information technology
  - Nursing staff

COMMUNITY HOSPITAL STEWARDSHIP
METRICS

MEASURE and REPORT

- Antibiotic use at the hospital and nursing unit level
  - DDD – defined daily dose
  - DOT – days of therapy
  - Purchase data
  - Resistance patterns

METRICS: ANTIBIOTIC USE

METRICS: ANTIBIOTIC RESISTANCE
COMMUNITY HOSPITAL STEWARDSHIP PROTOCOLS

- Institutional guidelines for pneumonia, UTI and SSTI
- Restricted antimicrobials
- Dosing guidelines for special populations
  - Renal dysfunction
  - Pediatrics
  - Neonatal
  - Obesity
- Criteria based IV to oral switch
- Drug – drug interaction alerts

TREATMENT GUIDELINES: SKIN, SOFT TISSUE INFECTION

Diffuse erythema without purulence
- β-hemolytic Streptococcus
- Empiric treatment with
  - Ampicillin
  - Cefazolin
  - Ceftriaxone
  - Penicillin

Focal erythema with purulence
- S. aureus
- Empiric treatment with
  - Vancomycin

STEWARDSHIP IN THE COMMUNITY HOSPITAL

HOSPITAL ONSET INFECTION

- Monitor for unintended consequences of antimicrobial treatment such as hospital onset C difficile infection
- Daily evaluation for high risk antibiotic treatment (e.g. clindamycin, quinolones)

STEWARDSHIP IN THE COMMUNITY HOSPITAL

MEDICATION SAFETY EVENTS

Review for trends or actionable items
- Antibiotic allergic reactions
- Aminoglycoside and vancomycin nephrotoxicity
- Vancomycin Red man syndrome
- Missing, incorrect weight for kinetic patients

STEWARDSHIP IN THE COMMUNITY HOSPITAL

ANTIBIOTIC ALLERGY ASSESSMENT

Medication History Tech allergy assessment/documentation
- 20% of hospitalized patients report a PCN allergy
  - This impacts antibiotic choice, effectiveness, cost and adverse effects
- <1% of “PCN allergic” patients will have an allergic reaction when treated with a 1st generation cephalosporins*
- Current process: incomplete or inaccurate documentation

STEWARDSHIP IN THE COMMUNITY HOSPITAL
ANTIBIOTIC ALLERGY ASSESSMENT

Aztreonam cost $80 per day, ceftriaxone cost $3 per day

STEWARDSHIP IN THE COMMUNITY HOSPITAL
URINALYSIS CRITERIA

- Appropriate use of antimicrobial agents requires accurate diagnosis. UTI diagnosis should be based on patient signs, symptoms and laboratory data
- Prior Micro Lab criteria for urine culture was 2 of the 3 following:
  - Positive LE, nitrite and WBC ≥3 per HPF
  - ASP recommendations
  - Change WBC from ≥3 to ≥10 per HPF
- Reject samples containing ≥10 squamous epithelial cells for culture due to sample contamination

Change in UA criteria has resulted in a 30% reduction in UAs processed by the Micro Lab

STEWARDSHIP IN THE COMMUNITY HOSPITAL
URINE CULTURE CRITERIA

A recent CDC report suggests that UTI treatment is avoidable ~40% of the time. Fridkin S et al. MMWR Morb Mortal Wkly Rep 2014;63:394

Implement urine culture criteria
- Presence of UTI symptoms: urgency, frequency, dysuria, suprapubic or flank pain, fever or chills
- Systemic signs or symptoms of infection without other identified source
- History of renal transplant, pregnancy or pending urologic procedure in which mucosal bleeding is expected
- Pediatric patient 2 years or younger

STEWARDSHIP IN THE COMMUNITY HOSPITAL
URINE CULTURE CRITERIA

Urine culture is not indicated for
- Changes in urine color, smell or turbidity
- Screening prior to non-urologic surgery
- Pyuria in an asymptomatic patient
- Documenting clearance of bacteriuria with the exception of pregnant patients

STEWARDSHIP IN THE COMMUNITY HOSPITAL
URINE CULTURE CRITERIA

CALL IT ASYMPTOMATIC BACTERIURIA (ASB)

STEWARDSHIP IN THE COMMUNITY HOSPITAL C. DIFFICILE TEST CRITERIA, TEST PROCESS
Medicare has reduced hospital reimbursement for certain hospital-acquired conditions
• C. difficile infections (CAUTI and CLABSI)
• Implications for SH? $3.5 million in lost reimbursement last year
• ≥ 40% of patients with (+) C. difficile test (by PCR) are colonized (without CDI)
ASP recommendations:
• Patient selection for C difficile testing...implemented with 25% reduction in (+) test
• Replace PCR with 2 stage testing (EIA ± GDH)

STEWARDSHIP IN THE COMMUNITY HOSPITAL TELE-STEWARDSHIP
Community Hospital stewardship pharmacist checklist
• HPI, clinical course
• ID diagnosis
• Labs/imaging
• Culture/susceptibility data
• Patient specific factors: allergies, renal function, drug interactions, age and weight

BUT THE DOCTOR WON’T LISTEN TO ME
Preparation (using SBAR) is key for confidence
Diagnosis drives treatment
• Reference published or institutional treatment guidelines
• Use “clarifying questions”*
• Bacteriuria ≠ UTI
• What are “HCAP” criteria?
*Clarifying Questions are simple questions of fact. They clarify the dilemma and provide the nuts and bolts so that the participants can ask good probing questions and provide useful feedback.

STEWARDSHIP IN THE COMMUNITY HOSPITAL EMR DOCUMENTATION
Why?
• To share patient assessment, treatment recommendations and rationale, disclaimer
• It’s an essential part of stewardship education
• You are part of the care team

Antimicrobial Stewardship in Long-term Care
Derek Vander Horst, PharmD
PGY2 Infectious Diseases Pharmacy Resident
Munson Medical Center
1. Explain the need for antimicrobial stewardship programs in our healthcare system
2. Discuss the role of pharmacy in antimicrobial stewardship as recommended by the Centers for Disease Control and Prevention
3. List ways that pharmacy technicians can play a valuable role in antimicrobial stewardship in various practice settings

Antimicrobials in the Community
• An estimated 60% of all antimicrobials are prescribed in the outpatient setting
  – In 2013, healthcare providers issued about 269 million antibiotic prescriptions
    • Equates to approximately 849 antibiotic prescriptions/1000 persons
    • 5 antibiotic prescriptions annually for every 6 people in the United States

Nursing Home Stewardship
• BP is an 81 year old female that resides in a long-term care facility (LTCF) due to her progressing dementia.
  – PMH:
    • Hypertension
    • Hyperlipidemia
    • Urinary Retention
    • Recurrent Urinary Tract Infections
    • Dementia
    • Type II Diabetes Mellitus
  – Allergies:
    • Penicillin
    • Ciprofloxacin
    • Trimethoprim/Sulfamethoxazole
    • Nitrofurantoin
  • Medication:
    • Cefazolin 500mg daily
    • Dnsiprod 10mg daily
    • Metronidazole 1000mg twice daily
    • Lisinopril 10mg daily

Community Antibiotic Prescribing Rates by State (2013/2014)*

Community ASP
???

Antimicrobials in the Community

Nursing Home Stewardship

Drug | Interp-MIC | MIC (ug/mL)
--- | --- | ---
Ampicillin | Resistant | ≥ 32
Amoxicillin-sulbactam | Suscept | ≤ 4
Cefazolin | Suscept | ≤ 1
Ceftazidime | Suscept | ≤ 1
Ceftaxime | Suscept | ≤ 1
Ciprofloxacin | Resistant | ≥ 4
Gentamicin | Suscept | ≤ 1
Levofloxacin | Resistant | ≥ 8
Meropenem | Suscept | ≤ 0.25
Nitrofurantoin | Suscept | ≤ 32
Piperacillin-tazobactam | Suscept | ≤ 4
Sulfamethoxazole-trimethoprim | Suscept | ≤ 20
Tobramycin | Suscept | ≤ 1
Nursing Home Stewardship

- After heroic efforts from the critical care team, BP succumbed to her illness.
- Upon meeting with the team, BP’s family is confused on how she got such a severe infection and why the antibiotics didn’t work for their loved one.
  - BP’s daughter asks the team, “Could this have been avoided?”

Long-term Care Stewardship

"You don’t know where you’re going until you know where you’ve been"
- English Proverb

Stewardship in Long-term Care

Approximately 4 million nursing home residents annually receive antibiotics per year.

Up to 75% of antibiotics are prescribed incorrectly.

Long-term Care Stewardship

- Currently, there are approximately 16,000 nursing homes in the United States that house an estimated 1.4 million residents.
- With the necessity of ASP implementation an assessment was performed to better understand the current ASP practices.
  - A survey occurred from August – September 2014.

### Table: Escherichia coli Sensitivity

<table>
<thead>
<tr>
<th>Drug</th>
<th>Inter-MIC</th>
<th>MIC (µg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampicillin</td>
<td>Suscept</td>
<td>≤ 32</td>
</tr>
<tr>
<td>Amoxicillin-sulbactam</td>
<td>Suscept</td>
<td>≤ 4</td>
</tr>
<tr>
<td>Cefazolin</td>
<td>Resistant</td>
<td>≥ 4</td>
</tr>
<tr>
<td>Cefepine</td>
<td>Resistant</td>
<td>≥ 1</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>Suscept</td>
<td>≤ 1</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>Resistant</td>
<td>≥ 8</td>
</tr>
<tr>
<td>Meropenem</td>
<td>Suscept</td>
<td>≤ 0.25</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>Suscept</td>
<td>32</td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td>Suscept</td>
<td>≤ 4</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>Resistant</td>
<td>≥ 16</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>Resistant</td>
<td>≥ 64</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>Resistant</td>
<td>≥ 64</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>Suscept</td>
<td>≤ 1</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>Suscept</td>
<td>≤ 1</td>
</tr>
<tr>
<td>Cefepine</td>
<td>Resistant</td>
<td>≥ 1</td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td>Resistant</td>
<td>≥ 128</td>
</tr>
<tr>
<td>Sulfamethoxazole-trimethoprim</td>
<td>Resistant</td>
<td>≥ 320</td>
</tr>
</tbody>
</table>

BP’s antibiotics are switched to meropenem, colistin, and tigecycline.
Michigan LTCF ASPs

- Many of the responses reflected an interest in gaining more training in:
  - ASP implementation
  - Antimicrobial therapy optimization
  - Antimicrobial de-escalation
  - Increasing buy-in from employees and administration

Core Elements for Nursing Home ASP

- Key Elements of Hospital Antimicrobial Stewardship Programs:
  1. Leadership support
  2. Accountability
  3. Drug Expertise
  4. Optimal Antimicrobial Use
  5. Tracking
  6. Reporting
  7. Education
Leadership Commitment

- Demonstrate commitment and support of safe and appropriate antimicrobial use within your facility
- The facility should have:
  - Written statements supporting ASP work
  - Incorporate ASP-related duties in employee responsibilities
  - Communicate the importance of ASP duties
  - Promote a culture to improve ASP buy-in

Accountability

- Identify leaders responsible for overseeing ASP activities within the facility
  - An ASP leader can be anyone!
    - Physician
    - Pharmacist
    - Nurse
  - ASP leaders should form the AST including
    - All providers
    - Nursing representation
    - Pharmacists
    - Infection prevention staff
    - Laboratory staff

Drug Expertise

- Establish relationships with pharmacists with experience or training in ASPs
- The facility should seek out experts whenever possible
  - Develop relationships with hospital ASP experts
    - Infectious diseases pharmacists & physicians
  - Utilize any pharmacist available
    - Pharmacokinetic & pharmacodynamics dose optimization
    - Dosing in renal dysfunction

Action

- Implement a minimum of one policy or practice to improve antibiotic use
  - The facility should start slow!
    - Try to only implement one policy or practice change at a time
  - Identify "problem areas" and hit those first!
- Potential Interventions:
  - Clinical guideline development
  - Antibiotic use
  - Restricted antimicrobials
  - Antimicrobial de-escalation
  - Disease state specific monitoring

Tracking

- Implement a process for measuring at least one antibiotic use process and antibiotic related outcome
- Measuring the success of any ASP is a serious challenge
  - At first, aim for the easy metrics
    - Antimicrobial use data
      - Why were antimicrobials prescribed? Were they appropriate?
      - Antimicrobial associated adverse events
      - C. difficile rates, local resistance rates
      - Total antimicrobial use
      - Days of therapy (DOT), defined daily doses (DDD)
    - Antimicrobial cost

Reporting

- Providing feedback to all staff on facility ASP activities
  - Obtaining quality data can be a serious challenge to ASPs
- Potential Metrics:
  - Personalized provider feedback
  - Site specific C. difficile rates
  - Site specific antibiogram data
  - Antimicrobial use data
    - DOT, DDD when possible
**Education**

- Provide resources to employees and patients on antimicrobial resistance and the efforts made to improve antimicrobial use
  - Everyone should be educated on the importance of the ASP
- Possible forms of education:
  - Infectious diseases guideline review to prescribers
  - Ensure rapid diagnostics are done when applicable
  - Rapid Urine Culture test is documented positive before prescribing antibiotics
  - Basics of antimicrobial resistance and when to use antibiotics to residents and their families

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**Pharmacy Role in LTCF ASPs**

- The pharmacist can play a vital role in long-term care antimicrobial stewardship
- Pharmacist Roles:
  - Drug expertise
    - Correct antimicrobial for given indication
    - Dosing optimization
    - Duration optimization
  - Education on clinical guideline adherence
    - Ensuring rapid diagnostic tests are done prior to initiating therapy
  - Policy creation
    - Creating a “criteria for use” for pre-defined antimicrobials

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**LTCF ASP Example**

FDA releases safety warning on the use of fluoroquinolones (FQs) for acute bacterial sinusitis, acute exacerbation of chronic bronchitis, and uncomplicated cystitis

Long-term care facility wants to monitor FQ prescribing to determine if their facilities’ usage is optimal

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**LTCF ASP Challenges**

- Many potential obstacles exist for antimicrobial stewardship programs in long-term care facilities
  - Metrics
    - What/how to track
    - Reporting tracked metrics
  - Electronic medical record integration/diversity
  - Consultant service
    - Only 1-2 visits to facility per month
    - Difficulty making “prospective” recommendations

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**LTCF ASP Resources**

- CDC Core Elements of Nursing Home Antibiotic Stewardship
  - [https://www.cdc.gov/longtermcare/pdfs/core-elements-antibiotic-stewardship.pdf](https://www.cdc.gov/longtermcare/pdfs/core-elements-antibiotic-stewardship.pdf)
- Michigan Antibiotic Resistance Reduction Coalition:
  - [http://www.mi-marr.org/](http://www.mi-marr.org/)
- CDC Get Smart About Antibiotics
Ambulatory Care Stewardship

- Ambulatory care is ripe with opportunity for antimicrobial stewardship
  - There is no clear guidance on how to implement ASPs in this setting (Yet!)
  - Many of the CDC Core Elements can be applied to the ambulatory care setting
- Leadership Support
- Accountability
- Drug Expertise
- Optimal Antimicrobial Use
- Tracking
- Reporting
- Education

Pharmacy’s [Potential] Role

- Ambulatory care is ripe for pharmacy interventions; especially in antimicrobial stewardship
- Possible roles:
  - Clinic leader and educator
  - Drug experts
    - Optimal antimicrobial with correct dose, duration, and frequency!
    - Patient and provider counseling on antimicrobials
    - Rapid diagnostics use when appropriate
  - MANY more possibilities!

Munson Medical Center (MMC): Antimicrobial Stewardship

Munson Medical Center: Antimicrobial Stewardship Team

- MMC Antimicrobial Stewardship Team:
  - Four infectious diseases physicians
    - Two infectious diseases nurse practitioners
  - One infectious disease pharmacist
    - One PGY2 infectious disease pharmacy resident
    - Five rotating PGY1 pharmacy residents
    - Microbiologists
    - Infection preventionists

Munson Medical Center: Formulary Restriction

- Predefined list of antimicrobials with use beyond 24 hours is restricted to infectious diseases providers

- Restricted antimicrobial ordered
- Orders reviewed every 24 hours
- Orders approved with ID consult or alternate provided

Munson Medical Center: Formulary Restriction

- Amikacin
- Amphotericin B
- Amphotericin B liposome
- Anidulafungin
- Aztreonam
- Ceftaroline
- Ceftolozane/tazobactam
- Ceftazidime/avibactam
- Colistin
- Daptomycin
- Ertapenem
- Fidaxomycin
- Imipenem/cilastatin
- Linezolid
- Meropenem
- Micafungin
- Posaconazole
- Quinupristin/dalfopristin
- Tigecycline
- Voriconazole
Munson Medical Center: Prospective Audit & Feedback

- Recommendations communicated to provider
  - De-escalation
  - Discontinuation (i.e. Culture negative after 72 hrs)
  - Redundant therapy (i.e. Pip/tazo + metronidazole)

“Tele-Stewardship”

ASP Implementation Challenges

- Challenges for Implementation:
  - Provider Pushback
  - Communication
  - Administrative red tape
  - Education and training
  - Inability to measure efficacy of ASP
    - Difficult to track metrics
  - Lack of resources

ASP Implementation

- Tips for Success:
  - Have an ASP leader
    - Preferably pharmacy AND physician champions
  - Start slow with low hanging fruit
    - Don’t bite off more than you can chew!
    - Implement one policy at a time
  - Get input from clinicians at each institution
  - Get individual hospital/department leadership involved
  - Provide education
  - Use technology to your advantage
Self-Assessment Question

Which of the following is listed as a pharmacy-driven intervention outlined in the CDC Checklist for Core Elements of Hospital Antibiotic Stewardship Programs?

a) Reporting cases of *Clostridium difficile* within the institution
b) Dose adjustments in cases of organ dysfunction
c) Distribution of current antibiogram to prescribers
d) Restricted antimicrobial list

Self-Assessment Question

TB is a pharmacist that is working with ID physicians to expand their institution’s antimicrobial stewardship program to a newly acquired affiliate hospital. Health-system leadership is worried about the success of the program because the affiliate hospital doesn’t have ID specialists. Which of the following is a strategy that can be used to overcome this challenge when implementing a new antimicrobial stewardship program?

a) “Tele-stewardship”
b) Unit specific antibiograms
c) Renal dose adjustment policies
d) Prospective audit & feedback

Self-Assessment Question

KM is a pharmacist that has been recently hired to implement an antimicrobial stewardship program (ASP) at her long-term care facility. Which of the following interventions best describes the “Core Element” of accountability?

a) Obtaining a signed document stating support for the ASP from the facility’s medical director
b) Appointing a physician and pharmacist to act as co-chairs of the ASP
c) Providing educational pamphlets to patient’s on antimicrobial resistance
d) Tracking facility specific antibiotic susceptibility patterns

Self-Assessment Question

Which of the following best describes the potential role of a pharmacist participating in antimicrobial stewardship in the ambulatory care setting?

a) Ensuring that rapid diagnostic tests for *Streptococcus pharyngitis* are performed prior to prescribing antibiotics
b) Refusing to take a leadership role in the ASP because the champion can only be a physician
c) Only counseling patients and their families on the most expensive antimicrobials
d) Insisting that physicians prescribe antibiotics for all pediatric patients because they are at a high risk for complications

Questions