Session 285-LO4

Antibiotic Stewardship: Innovative Practices in the Community Hospital Setting

Disclosure

The program chair and presenters for this continuing education activity have reported no relevant financial relationships, except:

- **Kristi Kuper -** Vizient: Employee

Learning Objectives

- Explain recent national legislative and policy efforts related to antibiotic stewardship.

- Describe innovative antibiotic stewardship practices that can be implemented in the community hospital setting.

- Describe how the use of technology can assist with supporting antimicrobial stewardship efforts.

- Summarize strategies that can be used to engage private practice physicians in stewardship activities.

Antibiotic Stewardship: The National Landscape

Kristi Kuper, PharmD, BCPS

Sr. Clinical Manager – Inf. Diseases

Vizient

Houston, TX

By a Show of Hands

- How many of you have completed the Checklist for Core Elements of Hospital Antibiotic Stewardship Programs (or equivalent)?

https://www.cdc.gov/getsmart/healthcare/pdfs/checklist.pdf

National Goals and Policies Inpatient Setting

- Before September 18, 2014
  - No national inpatient stewardship goals or policies
  - Antibiotic stewardship questions were included as "non citation" questions on CMS inpatient infection control worksheet
  - Some national goals on outpatient antibiotic use to reduce prescribing for ear infections and colds
- On September 18, 2014
  - White House issues an Executive Order for Combating Antibiotic Resistant Bacteria

https://www.whitehouse.gov/the-press-office/2014/09/18/executive-order-combating-antibiotic-resistant-bacteria
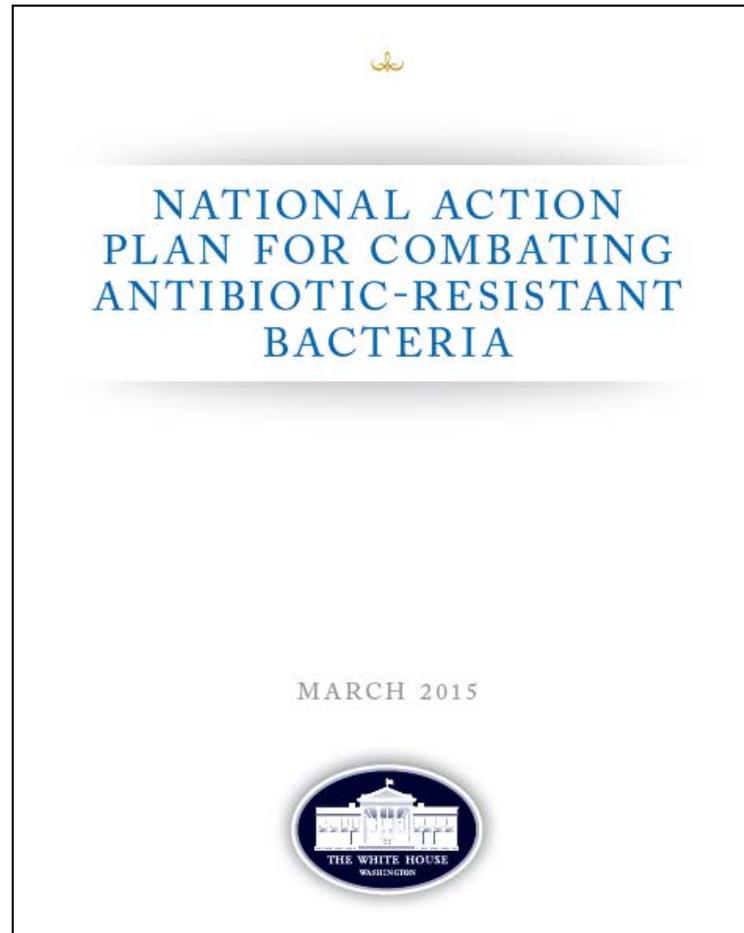
PCAST Report

Antibiotic Stewardship as a Condition of Participation

By the end of 2017, CMS should have Federal regulations (Conditions of Participation) in place that will require U.S. hospitals, critical access hospitals, and long-term care and nursing home facilities to have in place robust antibiotic stewardship programs that adhere to best practices, such as those contained in the CDC Core Elements for Hospital Antibiotic Stewardship Program recommendations. Similar requirements should be phased in rapidly for other settings including long-term acute care hospitals, other post-acute facilities, ambulatory, surgery centers, and dialysis centers.

National Action Plan for Combating Antibiotic-Resistant Bacteria (CARB)

National Action Plan for Combating Antibiotic-Resistant Bacteria

1. Slow emergence of resistant bacteria and prevent the spread of resistant infections
2. Strengthen national "One-Health" surveillance efforts to combat resistance
3. Advance development and use of rapid and innovative diagnostic tests for identification and characterization of resistant bacteria
4. Accelerate basic and applied research and development for new antibiotics, other therapeutics and vaccines
5. Improve international collaboration and capacities for antibiotic-resistance prevention, surveillance, control, and antibiotic research and development

National Strategy for Combating Antibiotic Resistant Bacteria- 2020 Goals

- All states will implement stewardship activities in healthcare settings

- All states will have established or enhanced regional efforts to reduce transmission of antibiotic resistant pathogens and improve appropriate antibiotic use in healthcare facilities across the continuum of care

- All federal facilities will have robust stewardship programs

- 95% of Medicare eligible hospitals and government facilities (DOD, VA) will report antibiotic use data to NHSN

National Strategy for Combating Antibiotic Resistant Bacteria- 2020 Goals

- Reduce inappropriate use for monitored conditions/agents by:
  - 20% in-patient from baseline
  - 50% outpatient from baseline
- Increased oversight on the utilization of antibiotics in food production
- CDC and AHRQ will expand research

White House Antimicrobial Summit

- In June 2015, convened 150 key stakeholders across human and animal health sectors to discuss the increasing problem of antibiotic resistance

- Human Health
  - Improving Inpatient Prescribing; Focus on Patients
  - Improving Outpatient Prescribing; Focus on Families
  - Improving Long-term Care Prescribing; Focus on Aging Population
  - Developing New Tools for Stewardship - Better Therapies, Better Diagnostics

CMS Conditions of Participation (COPs)

CMS COPs for Long Term Care

- Released in July 2015
- CMS received over 1000 comments
- Published final rule on October 4, 2016
- Each facility's infection prevention and control program include an antibiotic stewardship program, which includes antibiotic use protocols and antibiotic monitoring
- Implementation deadline for antibiotic stewardship
  - 1 year following effective date of the final rule

CMS Proposed COPs
Acute Care/Critical Access Hospital

- Released for public comment in June 2016
- First substantial update decades
- Acute care and critical access hospitals must meet these regulatory requirements in order to participate in Medicare
- Covers multiple different unrelated topics
  - Non discrimination
  - Licensed independent practitioner definition
  - Medical records
  - Quality Assessment and Performance (QAPI)
  - Infection Prevention <u>and Antibiotic Stewardship</u>

Antibiotic Stewardship

- Added as a component of infection control
- Strengthens partnership between infection prevention program and antibiotic stewardship pharmacist while recognizing that each are different
- Antibiotic stewardship programs should follow national guidelines
  - Intentionally left non prescriptive
- The ASP program should be hospital wide
- Should be integrated into QAPI program
- Requires a dedicated leader

The Joint Commission

The Joint Commission

- Medication Management Standard MM 09.01.01
- The [critical access] hospital has an antimicrobial stewardship program based on current scientific literature
- 8 Elements of Performance (EPs)
- Surveying begins January 1, 2017

EP 1 - Leadership

- Leaders establish antimicrobial stewardship as an organizational priority
- Examples of leadership commitment include:
  - Accountability documents
  - Budget plans
  - Infection prevention plans
  - Performance improvement plans
  - Using the EHR to collect antimicrobial stewardship data

EP 2 – Staff Education

The [critical access] hospital educates staff and licensed independent practitioners involved in antimicrobial ordering, dispensing, administration, and monitoring about antimicrobial resistance and antimicrobial stewardship practices.

Education occurs upon hire or granting of initial privileges and periodically thereafter, based on organizational need.

EP 3 – Patient Education

- The [critical access] hospital educates patients, and their families, as needed, regarding the appropriate use of antimicrobial medications, including antibiotics

http://www.cdc.gov/getsmart/community/downloads/getsmart-chart.pdf

EP 4 – Team Composition

- The [critical access] hospital has an antimicrobial stewardship multidisciplinary team that includes the following members, when available in the setting:
  - Infectious disease physician
  - Infection preventionist(s)
  - Pharmacist(s)
  - Practitioner
- Note 1: *Part-time or consultant staff are acceptable as members of the antimicrobial stewardship multidisciplinary team.*
- Note 2: *Telehealth staff are acceptable as members of the antimicrobial stewardship multidisciplinary team.*

Composition

- In repeated surveys, 40% of hospitals do not have an ID physician

- In a survey of 211 hospitals in May 2016, team composition included

Discipline	Percentage
Pharmacists	87%
Infection Preventionists	77%
Information Technology	42%
Healthcare epidemiologist	54%
Microbiology	100%
Nursing	17%
Quality improvement	31%

EP 5 : Core Elements

1. Leadership commitment: Dedicating necessary human, financial, and information technology resources.

2. Accountability: Appointing a single leader responsible for program outcomes. Experience with successful programs shows that a physician leader is effective.

3. Drug expertise: Appointing a single pharmacist leader responsible for working to improve antibiotic use.

4. Action: Implementing recommended actions, such as systemic evaluation of ongoing treatment need, after a set period of initial treatment (for example, "antibiotic time out" after 48 hours).

EP 5 : Core Elements

5. Tracking: Monitoring the antimicrobial stewardship program, which may include information on antibiotic prescribing and resistance patterns.

6. Reporting: Regularly reporting information on the antimicrobial stewardship program, which may include information on antibiotic use and resistance, to doctors, nurses, and relevant staff.

7. Education: Educating practitioners, staff, and patients on the antimicrobial program, which may include information about resistance and optimal prescribing. (*See also* IC.02.01.01, EP 1 and NPSG.07.03.01, EP 5)
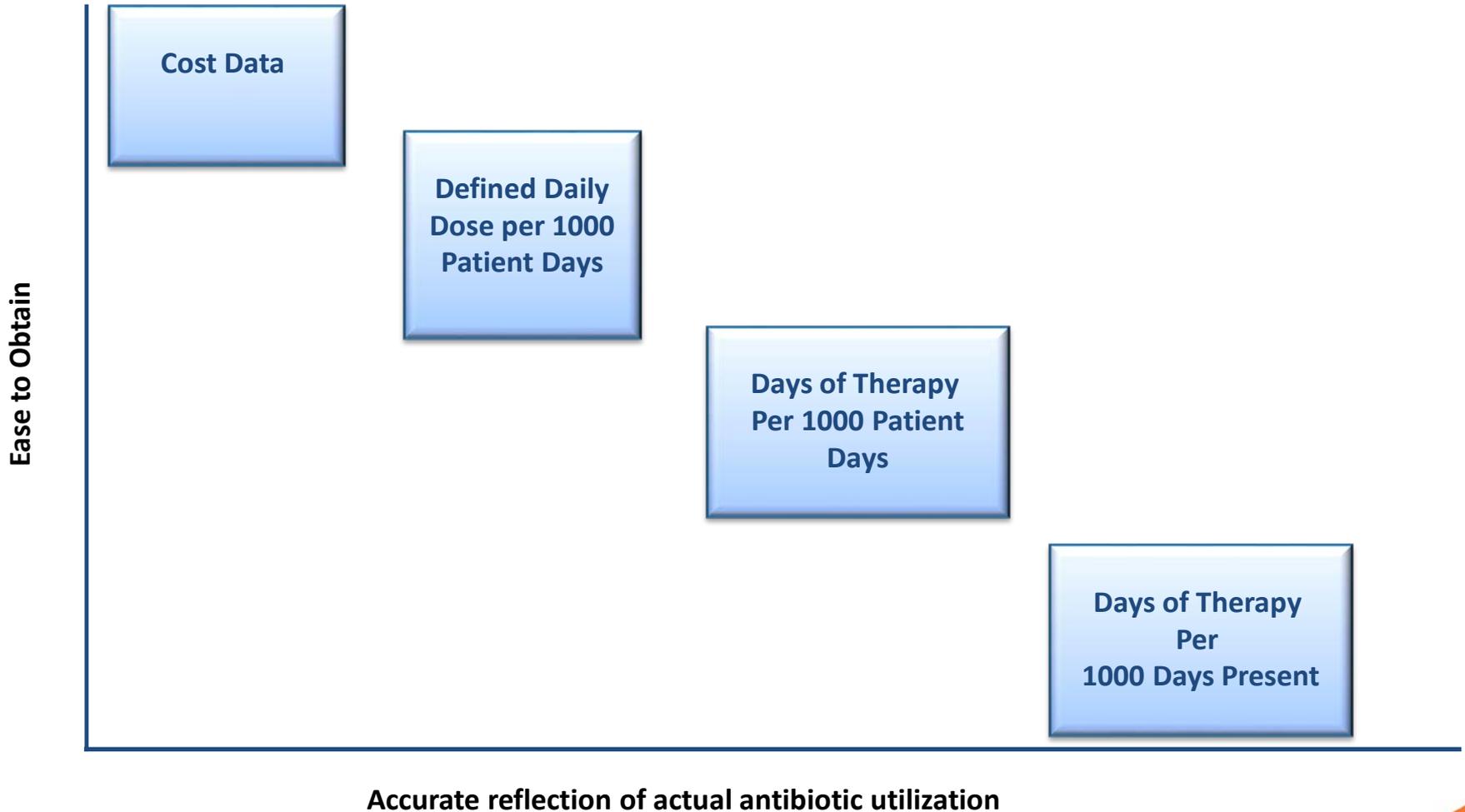
EP 6 – Policies and Protocols

- The [critical access] hospital's antimicrobial stewardship program uses organization-approved multidisciplinary protocols(for example, policies and procedures).

- Note: *Examples of protocols are as follows:*
  - *Antibiotic Formulary Restrictions*
  - *Assessment of Appropriateness of Antibiotics for Community- Acquired Pneumonia*
  - *Assessment of Appropriateness of Antibiotics for Skin and Soft Tissue Infections*
  - *Assessment of Appropriateness of Antibiotics for Urinary Tract Infections*
  - *Care of the Patient with Clostridium difficile (c.-diff)*
  - *Guidelines for Antimicrobial Use in Adults*
  - *Guidelines for Antimicrobial Use in Pediatrics*
  - *Plan for Parenteral to Oral Antibiotic Conversion*
  - *Preauthorization Requirements for Specific Antimicrobials*
  - *Use of Prophylactic Antibiotics*

EP 7 - Reporting

The [critical access] hospital collects, analyzes, and reports data on its antimicrobial stewardship program.

Note: *Examples of topics to collect and analyze data on may include evaluation of the antimicrobial stewardship program, antimicrobial prescribing patterns, and antimicrobial resistance patterns.*

Measuring Antibiotic Use

Other Legislation

- Patient Safety Improvement Act of 2016 (S.2467)
  - Sen. Sheldon Whitehouse (D-RI)
  - Focus on combatting healthcare associated infections
  - Includes antibiotic stewardship as part of the bill
- Strategies to Address Antibiotic Resistance Act (S.3176)
  - Sen. Sherrod Brown (D-OH)
  - Amends the Public Health Service Act
  - Enhances efforts to address antibiotic resistance

When will the Joint Commission begin surveying a hospital on their antibiotic stewardship program?

A December 1, 2016

B January 1, 2017

C July 1, 2016

D January 1, 2018

The CMS Conditions of Participation for Antibiotic Stewardship In Acute Care Hospitals Have Been Officially Approved

A TRUE

B FALSE

Key Takeaways

- Key Takeaway #1
  - All hospitals should have already completed the Core Elements Checklist or a similar gap analysis for Inpatient Antibiotic Stewardship Programs
- Key Takeaway #2
  - A successful antibiotic stewardship begins at the top. The C Suite must be engaged in the conversation and have shown commitment to support the program
- Key Takeaway #3
  - All hospitals should have a mechanism in place to measure antibiotic utilization and resistance

Innovative Practices:
Williamson Medical Center

Montgomery Williams, Pharm.D., BCPS
Assistant Professor
Belmont University College of Pharmacy
Franklin, TN

Williamson Medical Center (WMC) Overview

- County-owned, non-profit, community hospital near large metropolitan area
- 185 licensed beds
  - 20 critical care beds
  - 20 bed pediatric hospital with separate pediatric emergency department
- 16 clinical staff pharmacists
- Three clinical specialists
  - Critical care
  - Pediatrics and neonatology
  - Internal medicine (hospitalist)
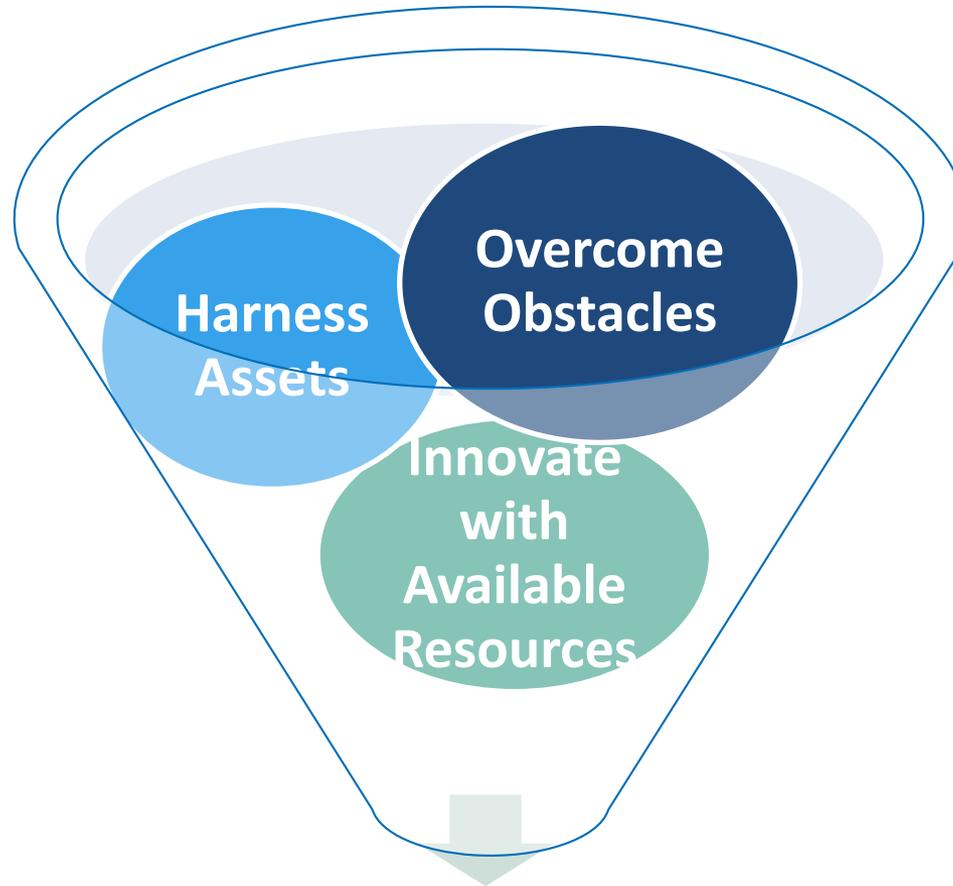   - Contracted through local college of pharmacy
- PGY1 started in June 2016

Mission and Challenge

- Mission of our ASP:

  - "To optimize clinical patient outcomes with regards to selection, dosing, and duration of antimicrobials while reducing toxicity, preventing resistance, and reducing cost"

- Challenge:

  - Achieve this mission and meet new standards with limited resources in a private, non-affiliated community hospital

Obstacles

- No dedicated ASP pharmacist
- No pharmacist with formal infectious disease training
- Recent decentralization of pharmacists
- Changing culture of the hospital
- Difficult to prove outcomes for benefits in patient mortality
  - Many confounding factors
  - No standardized system for measurement

Assets

Harness Assets

Overcome Obstacles

Innovate with Available Resources

Achieve Mission

WMC ASP's Areas of Innovation

- ASP Administrative Committee
- Incorporation of rapid diagnostic testing
  - Blood culture identification
  - Respiratory viral panel
  - Meningitis/encephalitis panel
- Education and quality improvement project to decrease treatment of asymptomatic bacteriuria
  - Decrease testing and treating for asymptomatic bacteriuria prior to joint and spine surgeries

Audience Poll

The members of my ASP team include (select all that apply) representatives from:

A. Pharmacy

B. ID Physician

C. Hospitalist physician

D. Information technology

E. Laboratory

F. Nursing

G. Patient Safety and Quality

ASP Core Team

ID Physician, Critical Care Pharmacist, Pediatric Pharmacist, Internal Medicine Pharmacist, Clinical Pharmacy Manager

Weekly Rounds

Weekly review of patient cases	Discuss recommendations

Identified areas for process improvement

Developed goals and initiatives to improve processes	Identified the need for additional support and buy-in

ASP Administrative Committee

ASP Administrative Committee

- Better align support
  - Rec
- Added
  - Nur
  - Info   pecialist)
  - Pati
  - Lab   Director)
  - Hos
- Group of committed individuals ⟶ Impact change

CDC. Core Elements of Hospital Antibiotic Stewardship Programs. Atlanta, GA: US Department of Health and Human Services, CDC; 2014. Retrieved from http://www.cdc.gov/getsmart/healthcare/ implementation/core-elements.html.

WMC ASP's Areas of Innovation

- ASP Administrative Committee
- Incorporation of rapid diagnostic testing
  - Blood culture identification (BCID)
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- Education and quality improvement project to decrease screening for and treatment of asymptomatic bacteriuria (ASB)
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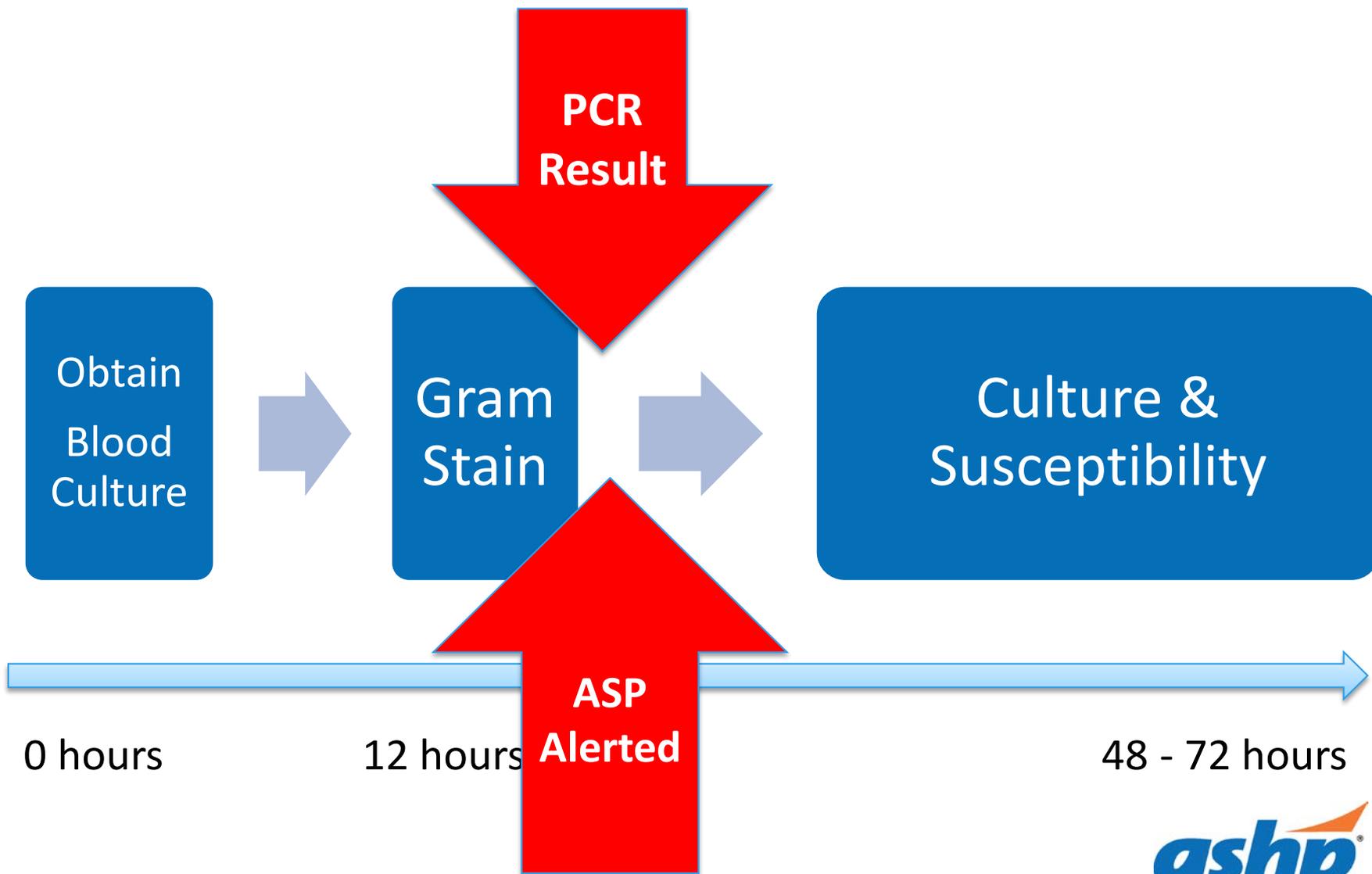
Audience Poll

1. My hospital incorporates rapid diagnostic testing into our antimicrobial stewardship committee.

    A YES

    B NO

2. If yes, what type of rapid diagnostic test do you have available?

    A. Blood culture

    B. Respiratory

    C. Gastrointestinal

    D. Influenza

    E. Meningitis

Rapid Diagnostic Testing

- Multiplex polymerase chain reaction (PCR) test
- Three FDA-approved panels available at WMC
    - Respiratory Panel
    - Blood Culture Identification Panel
    - Meningitis/Encephalitis Panel

ASP Pharmacists' Response to BCID

- Implemented BCID in October of 2015
- Email alerts to ASP pharmacists began in January 2016
  - ASP pharmacists respond to results during regular business hours, 7 days a week
    - ASP pharmacists split call on weekends
    - Pharmacy PGY1 residents respond to alerts on service weekends
  - ASP pharmacist reviews patient chart for appropriate antibiotic regimens
    - Calls physician with necessary recommendations
    - Documents interventions

How are BCID Results Reported?

WMC Experience with BCID

- Performed a medication use evaluation in May of 2016
  - Reviewed data from January through April 2016
    - ASP pharmacists' documentation in clinical decision support system in response to triggers
    - Positive reports from microbiology lab
- Results
  - 115 patients with positive BCID results reported by microbiology lab
  - 122 interventions were made based on positive BCID

Organisms, No. (%)	n = 115
Gram (+) bacteria	76 (66.1)
Meth. susceptible *S. aureus*	2 (1.7)
Meth. resistant S. aureus	3 (2.6)
Coagulase (-) staphylococci	49 (42.6)
Streptococcus pyogenes	4 (3.5)
Streptococcus pneumoniae	2 (1.7)
Viridans streptococci	1 (1)
Other *Strep* sp.	10 (8.7)
Enterococcus	5 (4.3)
Gram (-) bacteria	35 (30.4)
E. coli	19 (16.5)
Klebsiella pneumoniae	5 (4.3)
Klebsiella oxytoca	1 (1)
Enterobacter cloacae	1 (1)
Enterobacteriaceae	2 (1.7)
H. influenzae	4 (3.5)
Pseudomonas aeruginosa	3 (2.6)
Miscellaneous	4 (3.5)
Candida glabrata	2 (1.7)
None	2 (1.7)

Interventions Based on BCID

WMC Experience with BCID

- Successes
  - Confirmation of appropriate antibiotics
  - De-escalation to more narrow and more appropriate antibiotics
  - Escalation of antibiotics to appropriately cover pathogen
  - Able to identify CoNS more rapidly
    - De-escalation of antibiotics if able
    - Avoidance of starting vancomycin in patients with gram positive cocci in clusters

WMC Experience with BCID

- Challenges
  - Interpretation by nursing and physicians
    - ○ Reporting entire results
      - ➢ Contaminated specimens
    - ○ Education conducted
  - Availability of pharmacists to respond to results 24/7
  - Patients discharged from the emergency department prior to results
    - ○ Consistent system for patient follow-up

Respiratory Panel

- PCR test run on nasopharyngeal swab

- Detects 20 respiratory pathogens

  - Including 3 bacterial species

- Instituted at WMC in November 2015

  - Unrestricted in pediatric ED and pediatric hospital

  - Restricted to Infectious Disease and Pulmonologists in adult population

  - Evaluated retrospectively for appropriateness of order and outcomes

    - Data presented in March 2016

WMC Respiratory Viral Panel Utilization November 2015- March 2016			
	Adults	Pediatrics	Total (%)
Samples collected	12	73	85
Test appropriate based on symptoms	12	72	84 (98.8%)
Results changed management	7	46	53 (62.3%)
Narrow or decrease duration of antibiotics	6	8	14 (16.5%)
Avoid antibiotics altogether	2	30	32 (37.6%)
Changed management to correct medication (Oseltamivir, Azithromycin)	0	6	6 (7.1%)
Avoid admission	0	20	20 (23.5%)
Decreased LOS	2	3	5 (5.9%)
Reduced need for further invasive procedure	4	9	13 (15.3%)

Meningitis/Encephalitis (ME) Panel

- PCR test run directly on cerebrospinal fluid (CSF)

- Detects 14 pathogens

  - Bacteria, viruses, and fungi

- Instituted at WMC in May of 2016

  - Reflexed on all CSF samples with > 5 WBC

    o Pediatric and adult patients

WMC Experience with ME Panel

- Data evaluated from May – September 12, 2016
- 29 panels reflexed for WBC > 5
  - 12 positive results
  - Average WBC for 29 panels 268
    - Range 1 to 3326
    - Average WBC for positive panels: 614
      - Range: 16 – 3326
    - Average WBC for negative panels: 38
      - Range: 1 – 203

WMC Experience with ME Panel

Pathogen Identified by ME Panel (n= 12)	Number of Patients with Each Pathogen Identified	CSF Culture Results
Enterovirus	7	No growth
Herpes simplex virus 2	3	No growth
Varicella zoster	1	No growth
Streptococcus agalactiae	1	Streptococcus agalactiae

Enterovirus ME Panels (n=7)	
Demographics	5 patients < 2 months old 48 year old female 24 year old male
Not admitted	2
Discharged within 24 hours	2
Antibiotics avoided	2
Antibiotics discontinued within 24 hours	4
HSV- 2 ME Panels (n=3)	
Demographics	50 year old female 56 year old female x 2 (3 months apart)
Not admitted	0
Discharged within 24 hours	0
Antibiotics avoided	2
Antibiotics discontinued within 48 hours	1

WMC ASP's Areas of Innovation

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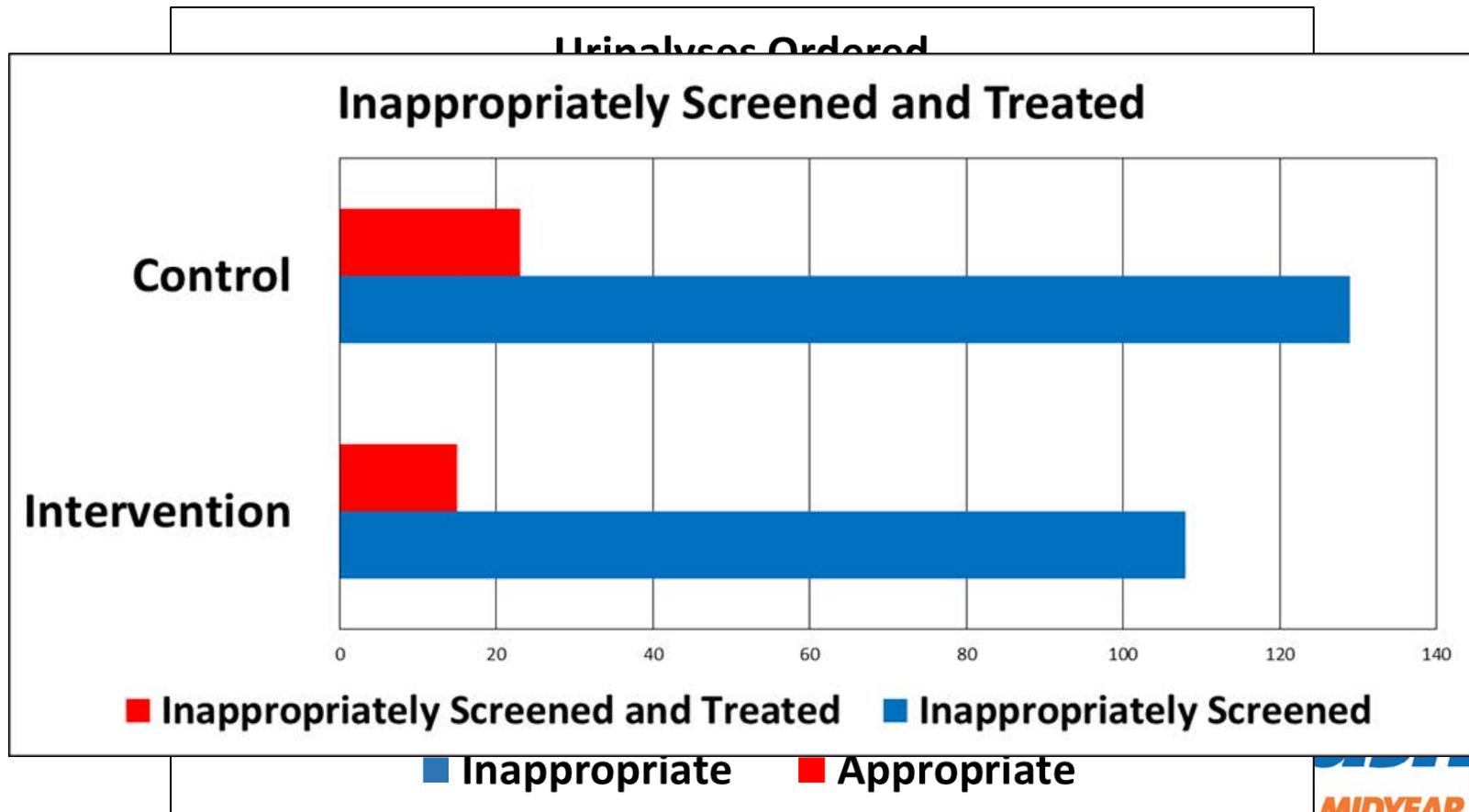
Initiative to Decrease Screening and Treatment of Asymptomatic Bacteriuria (ASB)

- Educational initiative and quality improvement project

  - Peer-to-peer education from ID physician to hospitalists and ED physicians

  - Developed pocket-cards and flyers for physicians and nurses

  - Educated ED nurses regarding the appropriate indications for obtaining a urinalysis

  - Updated ED nursing order forms to standardize urinalysis and urine culture ordering

  - Developed patient brochures explaining the diagnosis of asymptomatic bacteriuria and clarified appropriate indications for antibiotics

Refer to supplemental materials online for sample educational document

Initiative to Decrease Screening and Treatment of Asymptomatic Bacteriuria (ASB)

- Evaluated impact of educational intervention and project using prospective chart review

Initiative to Decrease Screening and Treatment of Asymptomatic Bacteriuria (ASB)

- Found a trend toward decreased ordering of inappropriate urinalyses and treatment of ASB
- Further impacts
  - ED physicians requested patient education brochures
  - Highlighted the need to further educate all clinical staff
    - Nursing staff often requesting urinalyses and/or calling physicians to request antibiotics
    - Updated several of the nurse-driven protocols to remove unnecessary urinalyses
  - Physicians were more receptive to future recommendations regarding discontinuation of antibiotics for ASB
- Evident that more is necessary for lasting impact

Decreasing Urinalyses from Pre-admission Testing (PAT)

- Discovered that urinalyses were being ordered on all female patients in PAT for orthopedic procedures

- Developed a questionnaire for PAT nurses

Decreasing Urinalyses from Pre-admission Testing (PAT)

- Implemented the PAT questionnaire in May 2015
  - If patient answers « yes », UA with reflex is ordered
    - If culture positive, patient treated with antibiotics prior to admission
- Results:
  - One year pre-implementation: 2,322 urinalyses ordered
  - One year post-implementation: 477 urinalyses ordered

Key Takeaways

- Key Takeaway #1
  - An administrative committee or inclusion of administration on ASP committee can improve "buy-in" and time/ease for implementing initiatives.
- Key Takeaway #2
  - Rapid diagnostic tests can be implemented in a community hospital setting and improve patient outcomes with the appropriate processes and ASP support.
- Key Takeaway #3
  - Educational initiatives can be modestly effective in changing practice but should be coupled with process changes for optimal results.

Acknowledgments

- Dr. Shaefer Spires, ASP Physician

- Dr. Tracey Bastian, Pharmacy Clinical manager

- Dr. Michael Wright,
  Critical Care Pharmacist

- Dr. Courtney Sutton, Pediatric Pharmacist

Innovative Practices:
Memorial Hermann Hospital – The Woodlands

Amy Schilling, PharmD, BCPS

Clinical Pharmacist – Infectious Diseases

The Woodlands, TX

About Memorial Hermann Health System

System Overview

- Hospital system based in Houston, TX
  - Texas Medical Center
    (Level 1 Trauma)
  - Children's Hospital
  - 9 Community Hospitals
  - TIRR Rehabilitation Hospital
- Mixed Pharmacy Staffing Model

About Memorial Hermann Health System

ID/ASP Team Overview

- Centralized Microbiology Lab functions
- System ID Committees
- ID Physician resources
- Pharmacy ID resources
  - 2014
    - 3 ID pharmacists + 1 ED pharmacist (ID trained)
  - 2016
    - 12 ID pharmacists system-wide

ID Pharmacists Team

- System ID pharmacists meet monthly
- Active projects
  - Standardizing system protocols (e.g. renal dosing)
  - Clinical decision support implementation
  - Order set reviews / development
  - Standardizing antibiograms
  - System formulary antimicrobial class reviews
  - Adult dose range calculator for antimicrobials
  - Antimicrobial shortage management
  - **Antibiotic stewardship education**
  - **Engaging the C Suite**

Antibiotic Stewardship Education

The Joint Commission Requirements

- Hospital educates staff and licensed independent practitioners involved in antimicrobial ordering, dispensing, administration, and monitoring about antimicrobial resistance and antimicrobial stewardship practices.

- Education occurs upon hire or granting of initial privileges and periodically thereafter, based on organizational need.

Pharmacy Staff Needs Assessment

- Survey to gather baseline data on training needs of pharmacy staff as it pertains to antibiotic stewardship

- Input from pharmacists throughout the system, which will be incorporated into the design of the training program

- A successful program will include ensuring that pharmacy staff are knowledgeable about key issues related to the appropriate treatment of infectious diseases

Survey Questions

- Q1: Which location do you currently work at? (If you work at more than one location, select the location where you spend the majority of time).

- Q2: How many years have you been a practicing pharmacist?

- Q3: Please rate your familiarity with the antibiotic stewardship related activities at your campus.

- Q4: Which of the following antibiotic stewardship training courses have you completed?

- Q5: Which of the following post graduate programs have you completed? (check all that apply)

Survey Questions

- Q5: Which of the following post graduate programs have you completed? (check all that apply)

- Q6: How would you rank your current knowledge of the following antibiotic related interventions?

- Q7: How would you rank your current knowledge of the following antibiotic related topics?

- Q8: In thinking about your personal learning style, please rank from (1) most preferred way to learn to (7) least preferred way to learn. [Note: each answer requires a number ranking before moving on to the next question.]

- Q9: Which of the following summarizes your opinion about offering pharmacy continuing education credit for programs?

Key Findings

- Variety of experience levels represented (0->16 years)
- Nearly one third of respondents have post-graduate training
- Majority of respondents were at least somewhat familiar with local campus stewardship activities
- Pharmacists were least confident in hepatic dosing and aminoglycoside dosing
- Most common educational needs
  - Viral infections
  - Antibiotic breakpoints and susceptibility testing
  - Fungal infections
  - Bacteremia/endocarditis

Preferred Learning Style

Rank	Description
1	Online pre-recorded webcast that I can participate in at my convenience (shorter increments but more frequently)
2	Online pre-recorded webcast that I can participate in at my convenience (longer increments and less frequently)
3	In person presentations (more frequently but shorter duration)
4	In person presentations (fewer presentations but longer duration)
5	Self study written materials
6	One hour webcasts with a live speaker
7	Mobile podcasts

(1) Most preferred to (7) Least preferred

Additional Findings

- Not surprising, pharmacists who had been practicing 3 years or less gave mobile podcasts a higher ranking than longer practicing pharmacists

- Only 5% of pharmacists reported taking an advanced training program (e.g. SIDP/MAD ID)

- More than 80% of pharmacists said that they were more incentivized to complete a training program if they receive CE

Survey Takeaways

- Very few pharmacists have completed an advanced antibiotic stewardship training program or have advanced training in ID
    - This training program will help satisfy this unmet need
- Webcasts on demand are most preferred
- For webcasts and in person training, shorter is better
- Pharmacists are motivated to complete educational programs if they are given CE

Survey Takeaways

- For **Level 1** education: Aminoglycoside dosing and hepatic dosing education should be prioritized over vancomycin
  - Need standardized system protocols before we can complete

- Pharmacists rating of knowledge of different therapeutic areas will help guide **Level 2** program development

Designing a System-wide Educational Program for Antibiotic Stewardship

<u>Mission Statement</u>

- An antimicrobial stewardship program (ASP) employs a variety of interventions to reduce antimicrobial misuse, improve patient outcomes and reduce development of resistant organisms

- In order to institute and expand an effective ASP throughout the health system, a minimum competency for all pharmacists must be established

Stewardship Educational Plan

Phase III:
Advanced training

Phase II: ASP training

Phase I: Standardized Competencies

Phase I: Standardized Competencies

- Web-based training
- Topics covered
  - IV to PO (Launched 1.0 hr CE)
  - Renal dosing (Launched 1.0 hr CE)
  - Basic pharmacokinetics (Under development 2016 Q4)
    - Vancomycin
    - Aminoglycosides

Phase II: ASP Training

- Level 2a: Basic program
  - Introducing concepts
  - Web-based training
- Level 2b: Midlevel program
  - Advanced discussion or knowledge application
  - In person training sessions led by ID pharmacists

Examples of Topics included in Phase II

- General Concepts
  - Antimicrobial class review
  - Normal flora
  - Common laboratory test interpretation
- Microbiology
  - Bacterial classification
  - Antimicrobial susceptibility testing
- Disease States
  - Urinary tract infections (UTIs)
  - Pneumonia
  - *C. difficile*

Phase III: Advanced Training

- Selected individuals with stewardship leadership responsibilities
- Programs available
  - Making a Difference in Infectious Diseases (MAD-ID)
  - Society of Infectious Diseases Pharmacists (SIDP)
  - Society for Healthcare Epidemiology (SHEA) Pre-meeting course
  - Infectious Diseases Society of America (IDSA) Pre-meeting course

Non Pharmacist Education

- Nursing & Physicians
  - One page information sheet
  - Brief online webinar
- Infection Preventionists
  - Planned for integration into Phase II training program

Prepared by Thomas Roduta, PharmD
PGY1 Mangement Resident

Engaging the C Suite

The Joint Commission Requirements

- Leaders establish antimicrobial stewardship as an organizational priority
  - Examples include
    - Accountability documents
    - Budget plans
    - Infection prevention plans
    - Performance improvement plans
    - Strategic plans
    - Using the electronic health record to collect antimicrobial stewardship data

Approaching the C suite

- Determine who is in charge of quality initiatives

- Tell the story

- Know the data

- Focus on quality

- Establish support with Letter of Commitment

Steps to Engaging the C suite

- Establish program goals

- Determine hospital personnel involvement

- Key responsibilities of ASP Medical Director

- Key responsibilities of ID Pharmacist

- Data to be reported

Establish program goals

- Optimize utilization of antimicrobial agents in order to realize improvement in patient outcomes and economic benefits

- Stabilize and reduce antimicrobial resistance

- Minimize the risk for secondary infections (e.g. *Clostridium difficile*)

- Minimize antimicrobial-related toxicities, adverse events, and medication errors

- Expand and optimize intravenous to oral antibiotic conversion plans

Establish program goals

- Establish and maintain appropriate guidelines for use for antimicrobial agents

- Develop and maintain annual antibiograms

- Create and maintain a hospital based Antimicrobial Stewardship Committee

- Report antimicrobial utilization and consumption data

- Develop action plans to improve metrics

- Conduct research to measure the impact of antimicrobial management interventions on patient safety and quality of care

Who needs to be involved?

Dellit TH et al. Clin Infect Dis. 2007;44:159-77.

What are expectations of ASP Medical Director?

- Codirect program with clinical pharmacist

- Must have patient care duties at the campus in which he/she serves

- Create and provide leadership for a campus based Antimicrobial Stewardship Committee with the purpose of overseeing campus antimicrobial utilization

- Assist medical practitioners in selecting appropriate antimicrobial therapy based on patient specific characteristics in collaboration with ID pharmacist

- Promote and demonstrate rational, cost-effective antimicrobial therapy

What are expectations of ASP Medical Director?

- Assist in developing policies and procedures

- Evaluate institutional antimicrobial resistance patterns

- Serve as an expert resource for antimicrobial pharmacology

- Collaborate daily, minimum weekly, with ID pharmacist to optimize patient care and outcomes

- Serve on system Infectious Diseases Steering Committee for ASPs

What is the expected compensation for the ASP Medical Director?

- Common models
    - Allocated number of hours per month
    - Annual salary/stipend
    - Bill as you go
- IDSA suggests $250/hr
- What we did
    - Initial projected 30 hours per month time commitment
    - Based on locally defined fair market value

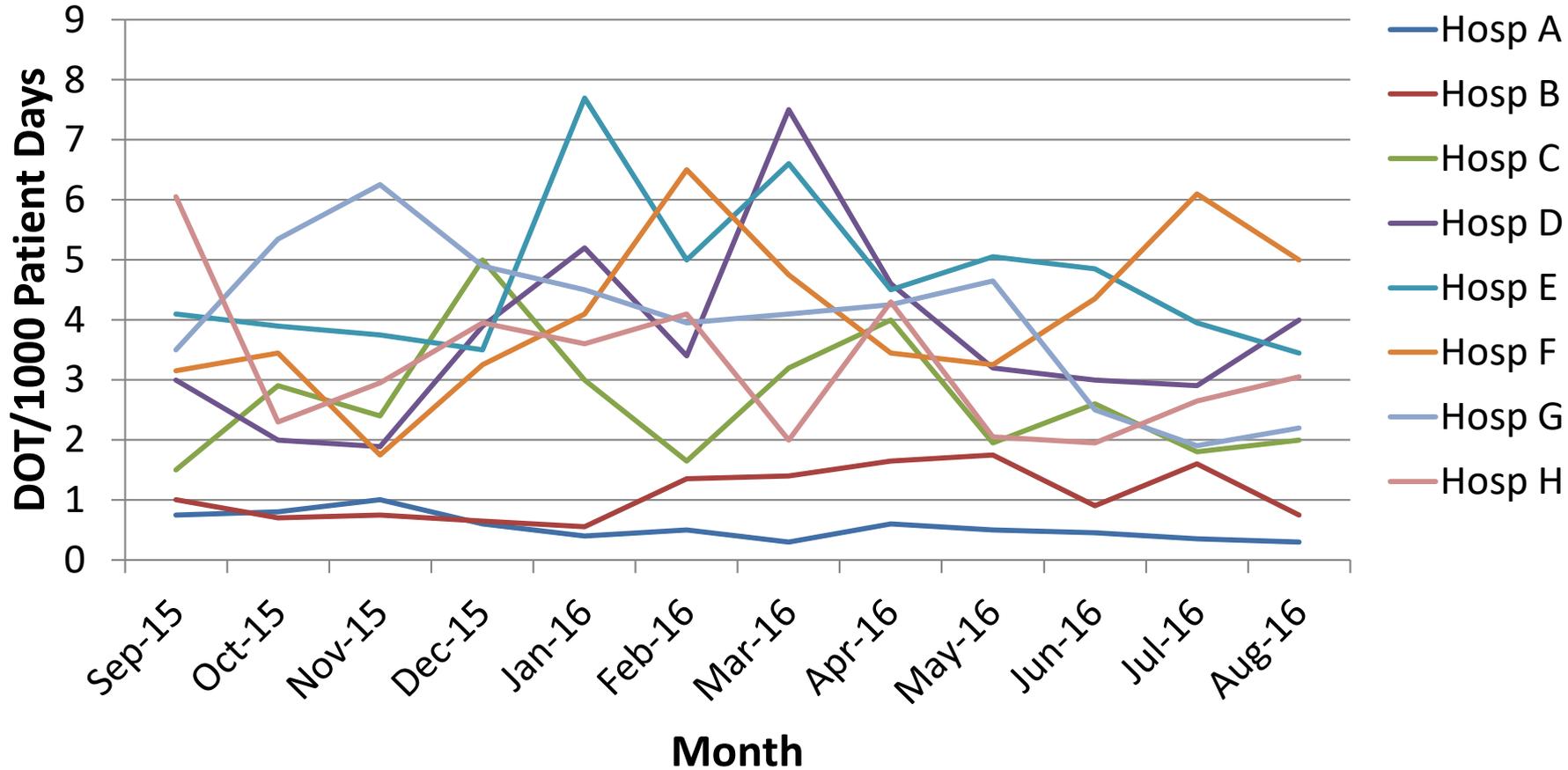McQuillen DP et al. Clin Infect Dis. 2008;47:1051-63.

What is your role as ID pharmacist?

- Codirect program with medical director
- Promote optimal use of antimicrobial agents
- Educate health professionals, patients, and the public about antimicrobial stewardship and infection prevention and control
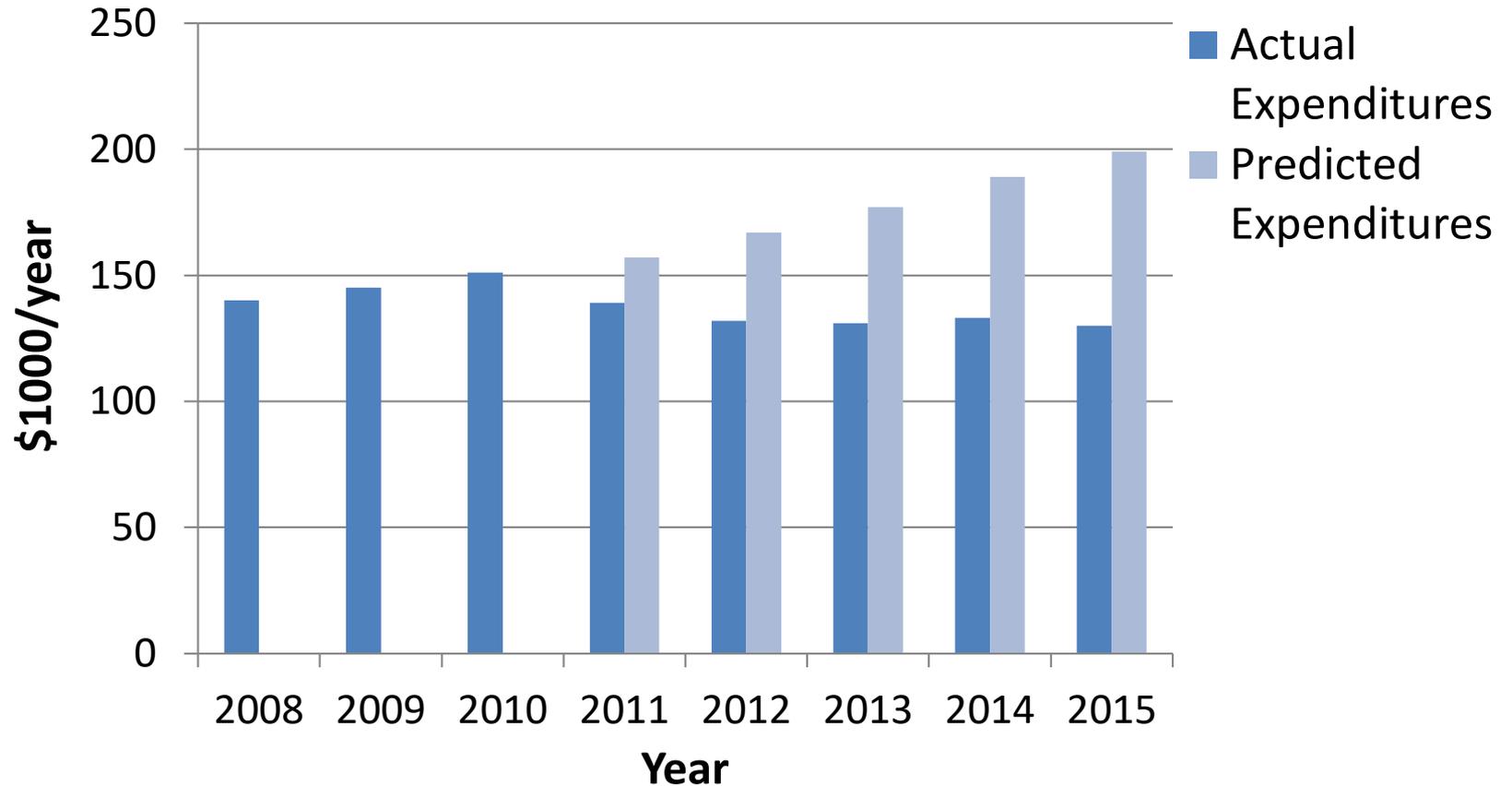- Serve on Infectious Diseases System Subcommittee

How are we going to track progress?

- Antimicrobial utilization
  - Days of therapy (DOT) / 1000 patient days (PD)
  - Defined Daily Dose (DDD) / 1000 patient days (PD)
  - Percent of oral therapy for select antimicrobial agents
  - Rate of de-escalation
  - Compliance with antimicrobial guidelines
  - Appropriateness of duration of antimicrobial therapy
- Antimicrobial and antifungal expenditures
- Rate of acceptance of ASP recommendations
- ASP Scorecard and evaluation of the medical care team
- Report data to the CDC AU Module
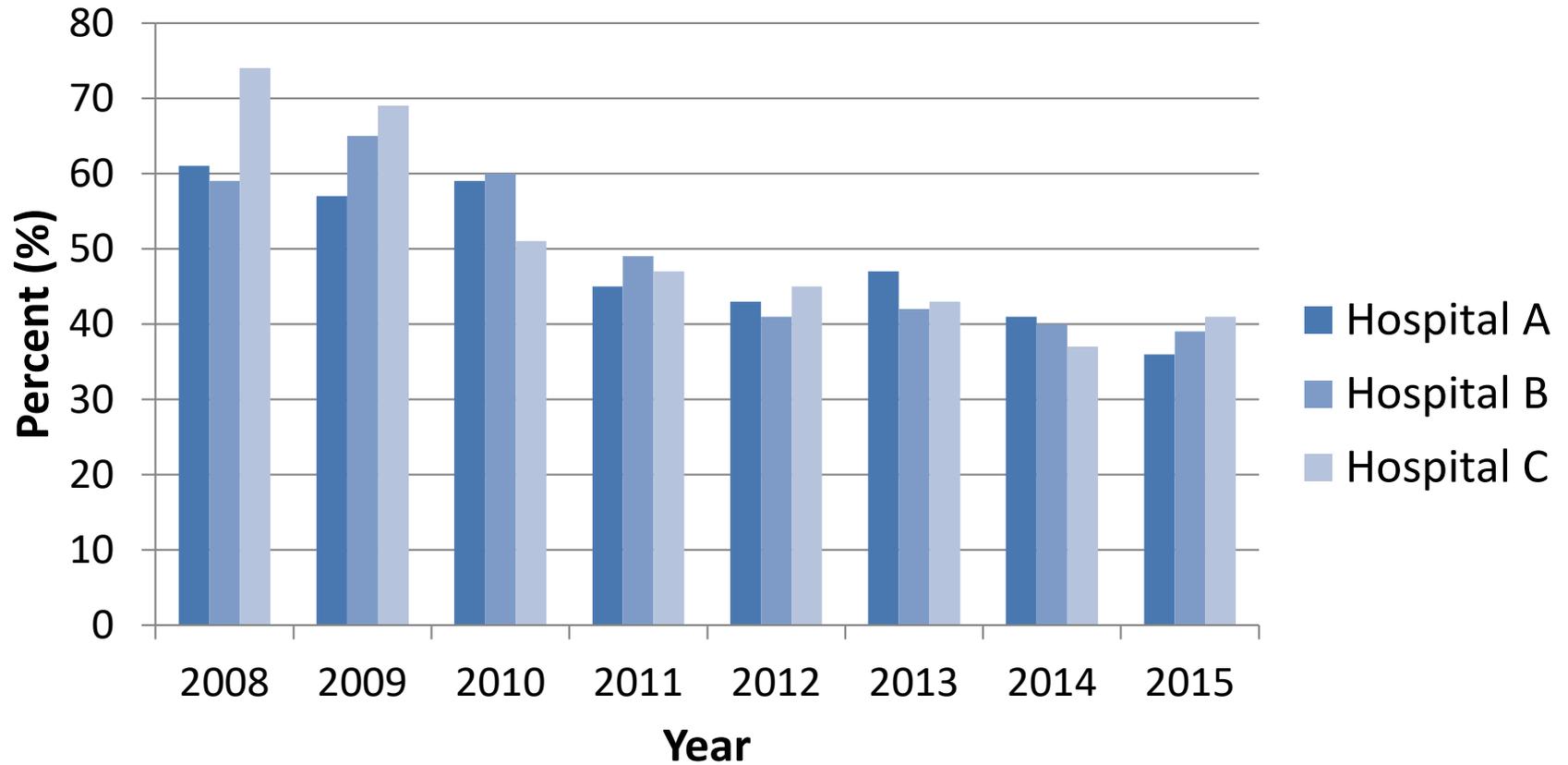
DOT/1000 Patient Days
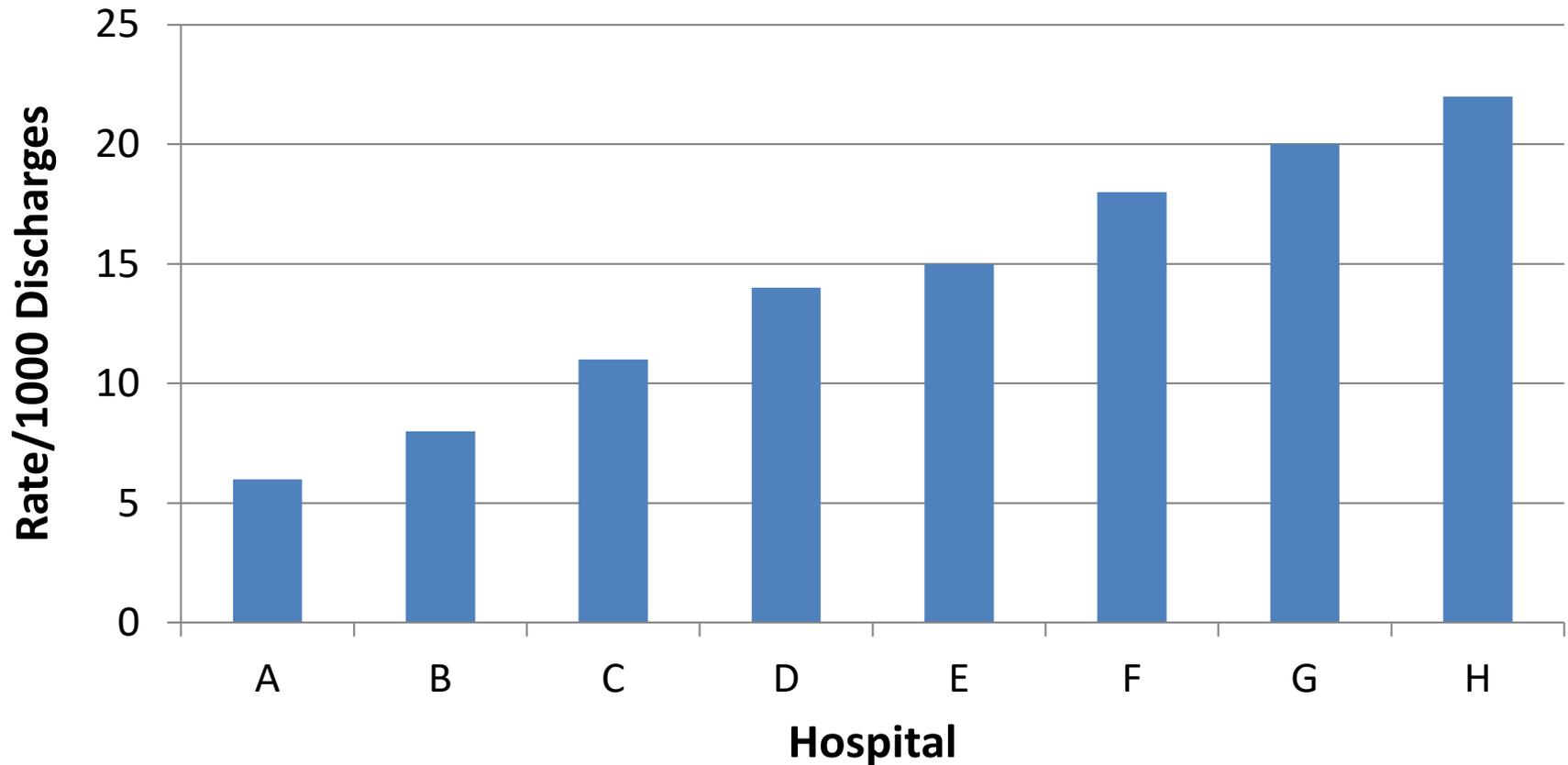
Antimicrobial Expenditures

Additional Examples of Quality Measures

- Cost of IV antibiotics reduced by 26%

- Broad-spectrum antimicrobial use reduced by 34%

- Total antimicrobial costs decreased by $48,044

- Decline in days of therapy by 6%

Akpan M et al. Antibiotics 2016;5(1): 5.

MRSA rates

C. difficile Rates

What are common approaches to paying physicians for ASP involvement?

A Allocated number of hours per month

B Annual salary/stipend

C Bill as you go

D All of the above

Establishing leadership commitment is a requirement of The Joint Commission.

A TRUE

B FALSE

All of the following are key members of the ASP team except:

A Microbiologist

B Infection control

C Food services

D Hospitalists

Key Takeaways

- Key Takeaway #1

  - Health system stewardship implementation does not have to start at the flagship hospital

- Key Takeaway #2

  - Antimicrobial stewardship interventions should involve all pharmacy staff

- Key Takeaway #3

  - Antimicrobial stewardship implementation requires engagement of physicians, nursing, pharmacy, and hospital leadership

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Innovative Practices: Pomona Valley Hospital Medical Center
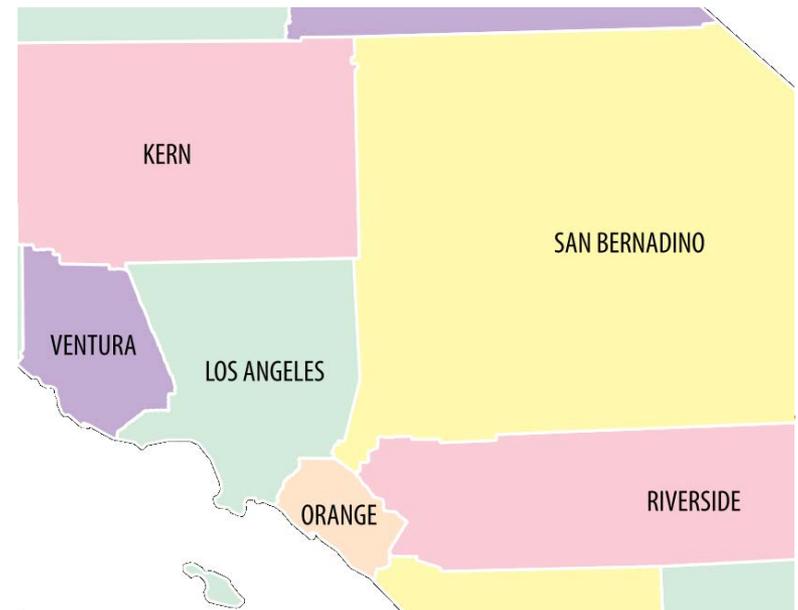
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Pomona, CA

Pomona Valley Hospital Medical Center (PVHMC)

- 437-bed acute care stand-alone hospital
- Located in Pomona, California
- Serve Los Angeles and west San Bernardino counties
- Inpatient services include:
  - Adult and Pediatric Emergency
  - Level 2 Trauma
  - Medical, Surgical and Cardiac ICU
  - Maternity (LDRP)
  - Level 3 Neonatal ICU
  - Heart and Vascular Center

PVHMC Antimicrobial Stewardship Program

PVHMC ASP Areas of Discussion

- Standardizing a process for patient identification for audit and feedback activities and incorporation of student pharmacists utilizing decision support software

- Incorporation of nursing-driven stewardship activities

- Development of external collaborative with nursing facilities

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Audit & Feedback

- The good:
  - Involved ID physician (ID medical director) with funding and willingness to do daily (Mon-Fri) ASP rounds for audit and feedback purposes
- The bad:
  - Only twice a week ID pharmacist availability
- The (proposed) solution:
  - Utilize student pharmacists (APPE)
- The challenge:
  - Patient identification for audit & feedback in absence of ID pharmacist

Results of Internal Medication Use Evaluations

- ~80% of patients receiving 72 hours or more of piperacillin/tazobactam could receive ASP intervention

- ~70% of patients receiving 48 hours of more of fluoroquinolone therapy could receive ASP intervention

- ~70% of patients with chief complaint of "acute dyspnea" or related symptoms could receive ASP intervention after 24 hours of admission

Student Pharmacist Involvement

- Six-week APPE rotation

- Week 1: Intensive training on patient identification and presentation with ASP team (2-4 days, ID pharmacist present)

- Week 2-6:

  - On days when ID pharmacist present, patient identification performed by ID pharmacist

  - On days when ID pharmacist absent, student pharmacist performs patient identification guided by decision support software based on rules:

    - Piperacillin/tazobactam x 72+ hours

    - Fluoroquinolone x 48+ hours

    - "Acute dyspnea" diagnoses (e.g. CHF, COPD, PNA, etc)

PVHMC ASP Areas of Discussion

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Nursing and Antimicrobial Stewardship

- To date, a number of care providers have been recognized as key players in antimicrobial stewardship efforts (physicians, pharmacists, microbiologists, infection preventionists, informaticists, etc.)

- Nursing has not historically been addressed in national antimicrobial stewardship guidelines and is vastly underutilized in stewardship efforts despite having the most bedside time and being the most numerous care providers in the hospital

Clin Infect Dis. 2016 Jan 1;62(1):84-9.

The Brainstorming Process

- January 2016 – General proposal at ASP Committee meeting to address underutilization of nursing in stewardship, with nursing leaders invited

- February – Taskforce convened and determined to pilot Nursing-Driven Antimicrobial Stewardship Rounds on Telemetry Unit

- March to April – Finalization of clinical targets of rounds and development of electronic support tools

- May – ASP Committee, Nursing Practice Council feedback and approval

- July – Nursing Antimicrobial Stewardship Rounds launched

Nursing-driven Antimicrobial Stewardship Rounds

- Improve patient safety
  - 48-hour antibiotic "time-out" assessment
  - Address hospital acquired condition (HAC) priorities (CDI, CLABSI, CAUTI)
- Enhance interdisciplinary collaborative practice
- Increase regulatory compliance

Nursing-driven Antimicrobial Stewardship Rounds

- 48 hour antibiotic time-out

  - Assessment of appropriateness of antibiotics at or after 48 hours of therapy (e.g. bug-drug mismatch, IV to PO opportunity, guideline appropriateness)

- Acid suppressant needs assessment

  - Based on conditions necessitating acid suppressant therapy (e.g. mechanical ventilation, GI bleed, symptomatic GERD, PUD, hypersecretory conditions, H. pylori treatment, stress ulcer prophylaxis with high risk indication)

- Urinary and central venous catheter needs assessment

  - Based on appropriate use criteria from infection prevention policy

Nursing-driven Antimicrobial Stewardship Rounds

- 2 days per week, Mornings, 1 hour
- Rounds team:
  - Primary Nurse (patient presenter)
  - Nurse Manager (rounds coordinator)
  - Nurse Practitioner
  - Pharmacist
  - Infection Preventionist (during initial pilot to determine viability)
- Target Patients
  - Antibiotics for 48+ hours
  - Acid suppressants for 24+ hours
  - Central line or Urinary catheter

Data Collection and Assessment

Focus: NURSING ROUNDS   **Date:** ___   **Focus ID:** ___

Date of Rounds ___

Physician Consults

Infectious Disease Consultant: ___   Critical Care Consultant: ___   Hospitalist/Managing Physician: ___

Rounds Team

Rounds Coordinator: ___   Nurse Practitioner: ___   Primary Nurse: ___

Pharmacist: ___   Infection Preventionist: ___   Additional Attendees: ___

Current Therapy

Antibiotic Therapy	
Start Date	Antibiotic

Antibiotic	
Start Date	Antibiotic Other

Indication for Antibiotic Therapy: ___   If Other is selected Document Indication Antibiotic Therapy: ___

Antibiotic Time-Out Assessment: ___

Recommendation
(if antibiotics not appropriate) ___

Data Collection and Assessment

Acid Suppressant Necessity
Must Meet at Least One of the Following Criteria: (Checkboxes can pick multiple choices)

☐ Symptomatic/Uncontrolled Gastroesophageal Reflux Disease (GERD)

☐ Documented Pepticulcer Disease

☐ Treatment of Helicobacter Pylori

☐ Active Upper GI Bleed

☐ Documented Erosive Esophagitis/Hypersecretory Conditions (Zollinger-Ellison Syndrome)

☐ Stress ulcer prophylaxis with high risk indication (active mechanical ventilation, history of GI bleed in past year, coagulopathy [defined as Platelets < 50,000, INR > 1.5, PTT > 2 x upper limit of normal] or traumatic brain/spinal cord injury)

Acid Suppressant Necessity Assessment/Recommendation: [_____] [...]

Urinary Catheter Necessity
Must Meet at Least One of the Following Criteria: (Checkboxes can pick multiple choices)

Date of Insertion [_____] 📅   Present on Admission ○ Yes ○ No

☐ Need for Strict I/O and Unable to use Urinal/Commode/Condom Catheter

☐ Hemodynamically Unstable

☐ Open Wound in Sacral/Perineal Area With Urinary Incontinence

☐ At End of Life to Improve Comfort

☐ Chemically/Physiologically Paralyzed

☐ Recent Gynecological or Perineal Procedure

☐ Condition Causing Urinary Retention, Such as Neurologic Bladder or Stricture

☐ Required Immobilization for Trauma or Surgery

Urinary Catheter Necessity Assessment/Recommendation: [_____] [...]

Central Venous Catheter Necessity
Must Meet at Least One of the Following Criteria (Checkboxes-can pick multiple choices)

Date of Insertion [_____] 📅   Present on Admission ○ Yes ○ No

☐ Hemodynabic Monitoring

☐ Vasoactive Medications or Receiving TPN

☐ Hemodialysis or Hemofiltration

☐ Transvenous Cardiac Pacemaker

☐ Long Term Chemotherapy Catheter

☐ Intravenous Fluid Resuscitation

☐ Poor Peripheral Venous Access With Ongoing Need for Venous Access

☐ IV Antibiotic Therapy Requiring >10 Days of Administration

☐ Tunneled Hemodialysis Catheter

Central Venous Catheter Assessment/Recommendation: [_____] [...]

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- Standardizing a process for patient identification for audit and feedback activities and incorporation of student pharmacists utilizing decision support software

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- Development of external collaborative with nursing facilities

Nursing Facility Collaborative

- Goal
  - Engage nearby nursing facilities in antimicrobial stewardship and infection control activities
- Proposed Involved Parties
  - Participating Nursing Facilities
  - Pomona Valley Hospital Medical Center
    - Infection Control/Quality Management
    - Antimicrobial Stewardship
    - Laboratory Services
    - Case Management
    - Sepsis Taskforce
  - California Department of Public Health

Key Takeaways

- Key Takeaway #1
  - Students can be effective ASP extenders
- Key Takeaway #2
  - Nursing is a key discipline to engage to assist with improving antibiotic use
- Key Takeaway #3
  - Engaging external healthcare facilities can be helpful to expand the reach of the hospital ASP

Which of the following practices may benefit antimicrobial stewardship efforts?

A Engaging student pharmacists

B Engaging nursing staff

C Engaging local nursing facilities

D All of the above

Session 285-LO4
Antibiotic Stewardship: Innovative Practices in the Community Hospital Setting