



How to address the most challenging core elements: Telehealth and other strategies

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4/25/18

Disclosures

John Veillette

- None

Whitney Buckel

- Honorarium from Merck Co for SHEA planning committee
- Salary support from LexiComp for consulting

Learning objectives

- Identify available resources for antimicrobial stewardship programs
- Explore innovative strategies for conducting stewardship in resource-limited settings
- Explain how access to ID resources can improve antimicrobial stewardship efforts
- Propose one way you could apply the principles of antimicrobial stewardship to your daily practice

Outline

- Brief literature review – stewardship in community hospitals
- Our experience at Intermountain Healthcare
- Core elements deep-dive
 - Tracking, reporting, action, education
- Resources and wrap-up

Stewardship in Community Hospitals

Antimicrobial Stewardship Program (ASP) Structure

ASPs can take many forms in community hospitals

- ID physician and pharmacist team
- ID physician or ID pharmacist alone
- ID physician on-site with non-ID clinical pharmacist
- ID physician off-site with non-ID physicians and pharmacists
- No ID support

FOR EXAMPLE:

Yam et al. utilized a weekly teleconference review with a remote ID physician and local pharmacists and CMO at a 141-bed hospital

Think beyond just those employed by your facility or in your near vicinity

Lockwood AR, et al. AJHP 2017;74:S52-s60, Day SR, et al OFID 2015;2:ofv064, Waters CD. AJHP 2015;72:466-8; Pasquale TR, et al AJHP 2014;71:1136-9; DiDiodato G, et al. BMJ Open Quality 2017;6; Leung V, et al. CJHP 2011;64:314-20; Bartlett JM, et al. AJHP 2014;71:943-9; 32. Libertain CR, et al. AJIC 2017;45:979-82; Storey et al. Antimicrob Res Infect Control 2012;1:32; Yam P, et al. Am J Health Syst Pharm 2012;69:1142-8; Michaels K, et al. Hosp Pharm 2012;47:608-16. Veillette JJ, et al. OFID 2017;4:S278-S9; Krey SC, et al. Journal Pharm Pract 2017;897190017743154

Just Like How Most Movies These Days Are Familiar...

Manual intervention at a 254-bed community hospital made a positive impact

Champion: pharmacist; Core strategy: culture review

committees to restrict the number of these agents on the formulary and monitor their use. Furthermore, systematic and ongoing monitoring of antibiotics is part of the standards set by the Joint Commission on Accreditation of Hospitals (JCAH).¹

In this paper I describe a culture and antibiotic monitoring service that was established to meet the needs of the medical staff and pharmacy department regarding appropriate antibiotic use in a 254-bed community hospital.

Actions January to December 1985	Interventions (n=202)
Resistant organism – antibiotic changed	75 (37%)
No antibiotic therapy with evidence of infection – antibiotic started	52 (26%)
Reduce number or spectrum of antibiotic	29 (14%)
Change in antibiotic dose or interval	20 (10%)
No action taken	26 (13%)

Von Seggern RL. AJHP 1987;44:1358-62.

Another Example at an 86-bed Community Hospital

Champion: pharmacy resident

Team: ID physician, ID pharmacist,
pharmacy resident

Core strategy: decentralized
pharmacist prospective audit and
feedback with weekly ASP meetings
with the ID physician (physicians
welcome)

Complementary strategies:
newsletter, mandatory ID consults,
antibiotic restrictions

Table 4. Usage of Injectable Vancomycin and Piperacillin–Tazobactam in a Sample of Medical and Intensive Care Unit Patients Before and After Formalization of an Antimicrobial Stewardship Program

Variable ^a	Before Formalization (n = 68)	After Formalization (n = 56)	p
Vancomycin			
Fraction (%) of all orders ^b	56/164 (34)	15/115 (13)	<0.0001 ^c
Mean ± S.D. DOT per order (days)	2.93 ± 2.38	1.43 ± 0.90	0.00035 ^d
Total no. DDD	189.25	15.25	
DDD/1,000 patient-days	588	62 ^e	<0.001 ^e
Piperacillin–tazobactam			
Fraction (%) of all orders ^b	35/164 (21)	18/115 (16)	0.2785 ^c
Mean ± S.D. DOT per order (days)	3.35 ± 2.34	3.64 ± 2.84	0.7165 ^d
Total no. DDD	88.84	41.71	
DDD/1,000 patient-days	276	170	<0.001 ^e

^aDDD = defined daily dose, DOT = duration of therapy.

^bDenominator is total number of orders for injectable antimicrobials.

^cFisher's exact test for proportions.

^dUnequal variance t test.

^ePoisson means test for rates.

Significantly reduced use of injectable antimicrobials.

Lockwood AR, et al. AJHP 2017;74:S52-s60

An Example Close to Home - Waycross, GA

Use of all antimicrobials declined 10%.

Champion: new ID physician

Team: 2 lead pharmacists, infection preventionists and microbiologists

Biweekly workgroup meetings

Core strategy: prospective audit and feedback of 12 antimicrobials

Complementary strategies: lecture series, guidelines, algorithms, and a pop-up requiring an indication for use in Meditech

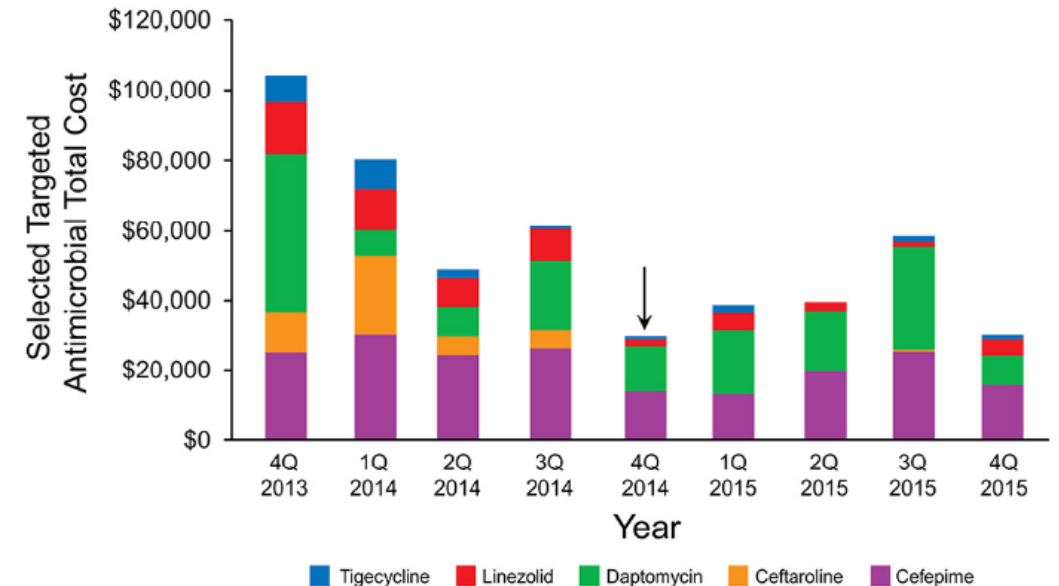


Fig 3. Selected targeted antimicrobial total cost in the 4Q of 2013 before antimicrobial stewardship program implementation and in 2014 and 2015 after its implementation. The arrow indicates implementation of the program in October 2014. 1Q, first quarter; 2Q, second quarter; 3Q, third quarter; 4Q, fourth quarter.

Libertin CR, et al. AJIC 2017;45:979-82

Stewardship at Intermountain

Program History – SCORE study

- **Design**

- Cluster randomized trial in 15 small hospitals

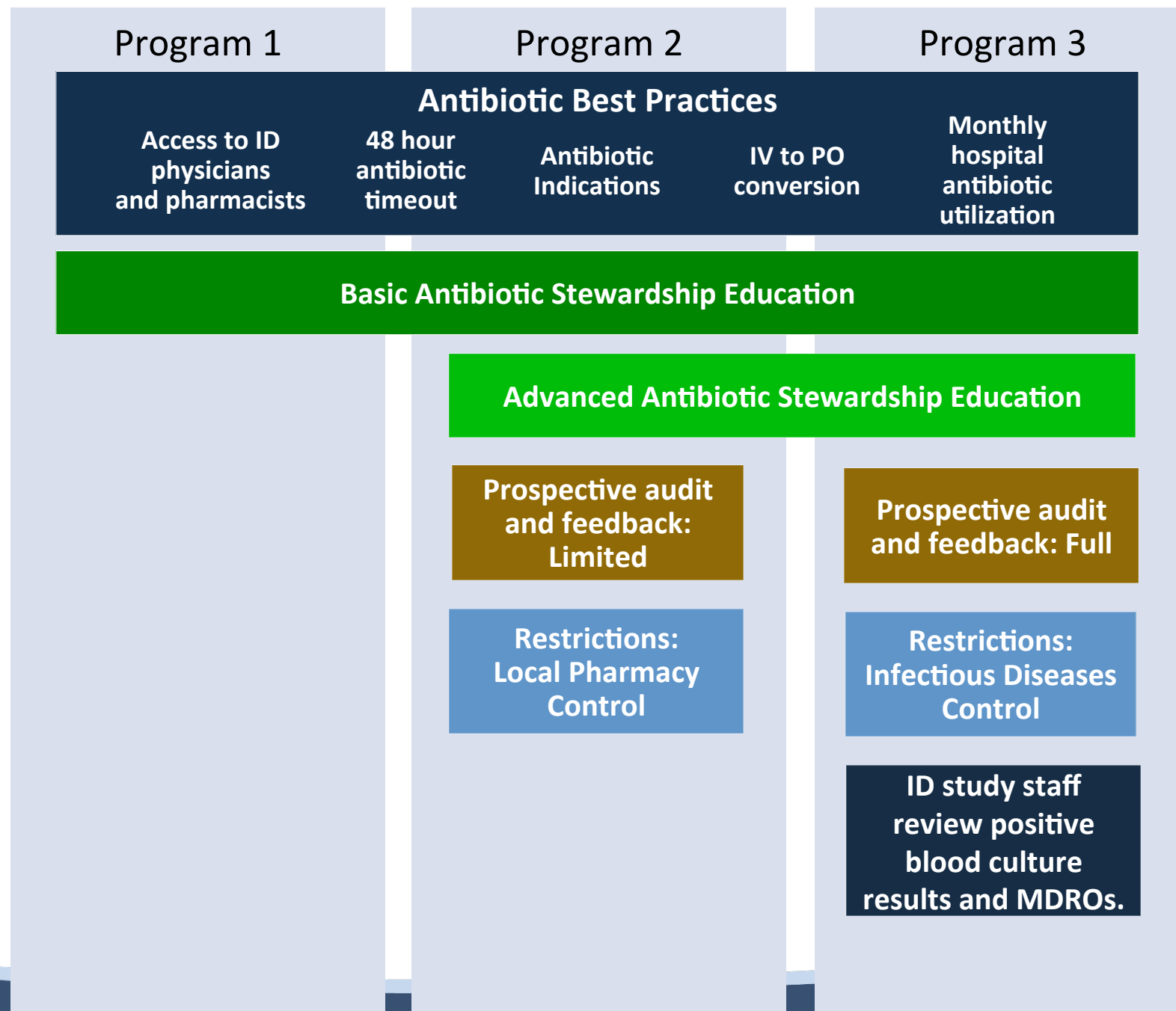
- **Objective**

- Define an optimal stewardship strategy

- **Methods**

- Hospitals randomized to one of three programs

SCORE - **S**tewardship in **C**ommunity Hospitals
Optimizing Outcomes and **R**esources



SCORE Study – Results and Conclusions

- **Baseline antibiotic use comparison** (normalized DOT/1,000 patient days)
 - Antimicrobial use in small hospitals was comparable to larger facilities
 - **Stewardship is needed!**
- **Significant reductions in antibiotic use**
 - No significant change in Program 1
 - All antibiotics – 17% reduction with Program 3 vs Program 1
 - Broad spectrum antibiotics – 30% reduction for Programs 2/3 vs Program 1
 - **Stewardship is feasible and can improve antimicrobial use**
- **>1,000 phone calls made to ID physician during 15 month study period**
 - **ID clinician access is needed in small hospitals**

Open Forum Infect Dis. 2016;1(S1):S1–68

Importance of stewardship in small hospitals

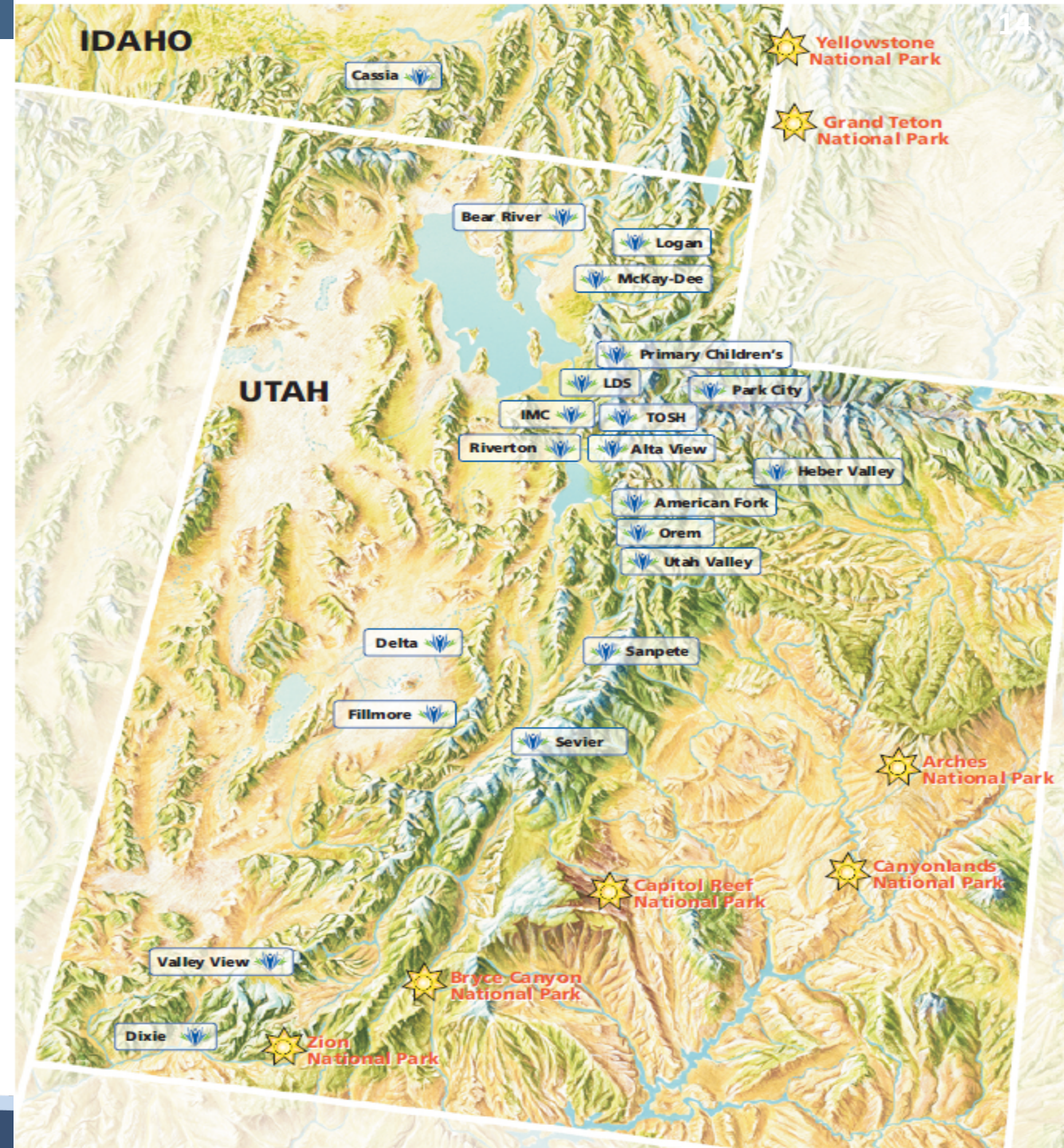
- **Similar antibiotic usage and *Clostridium difficile* rates to larger facilities**
- **CDC Core Elements**
 - “Improving antibiotic prescribing...is imperative to improving patient outcomes”
 - *C.diff* reduction, prevention of resistance
- **Regulatory requirements**
 - The Joint Commission (TJC) standards – 1/2017
 - Medicare Flex Grant funding (critical access hospitals) - \$\$
 - Centers for Medicare/Medicaid Services (proposed) - \$\$

How with limited time and resources?

Infectious Diseases TeleHealth Program

ID services for 16 community/rural hospitals (14-150 beds)

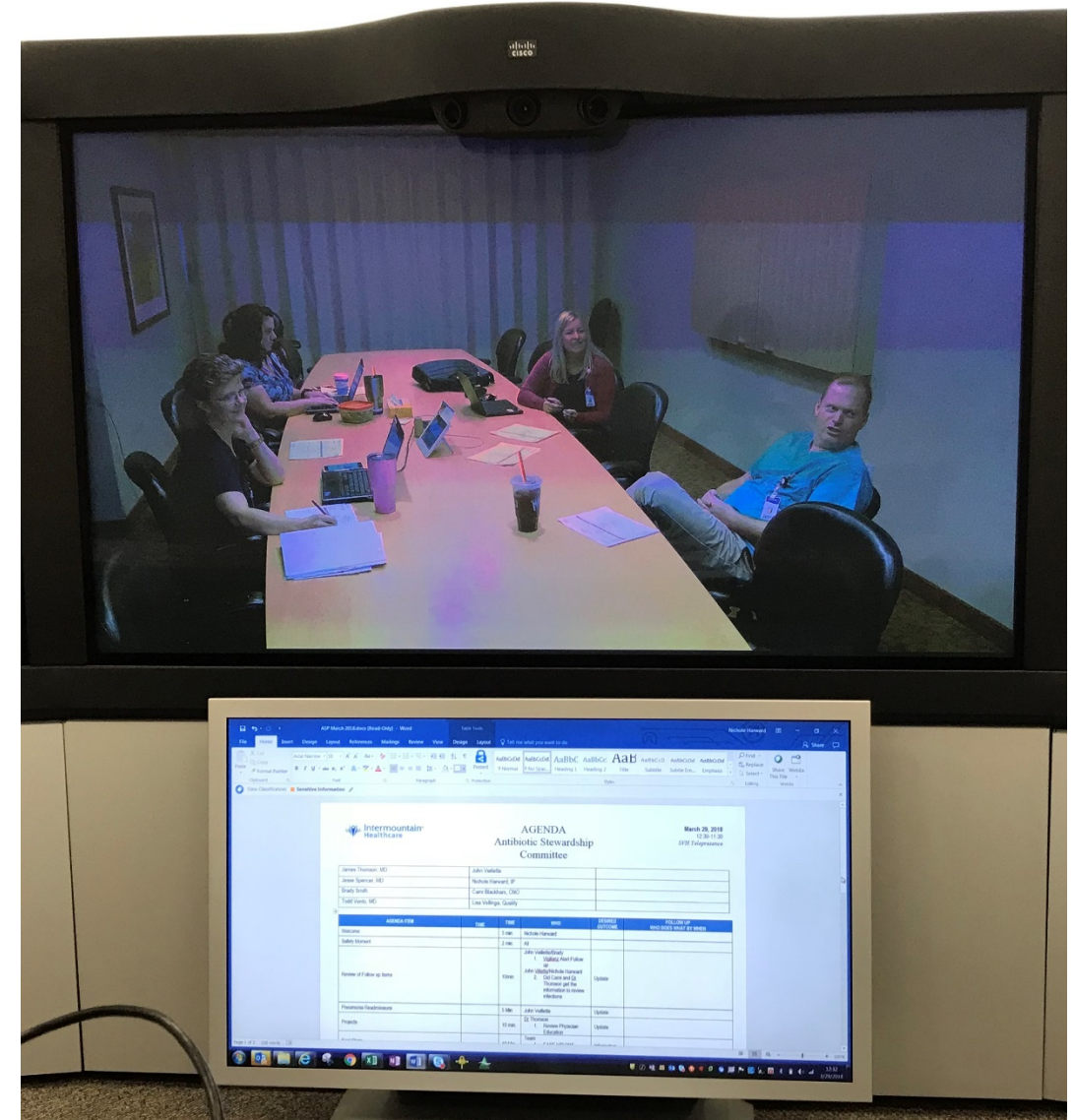
- **Inpatient face-to-face ID consultation via in-room camera**
 - M-F 8:30 am - 4:30 pm
- **Telephone ID consultation and advice**
 - Inpatient, outpatient, emergency department, acute care clinics: 24/7 coverage via ID Hotline
- **Antimicrobial stewardship support**
 - ID PharmD and ID MD



TeleHealth ASP Concepts

Local Empowerment

- **Establish local ASPs at each facility**
 - MD + PharmD champions
 - Infection Prevention, Nursing
 - Quality/Patient Safety
 - Leadership
- **Mentor front line pharmacy staff**
- **ID MD and ID PharmD support**
 - Annual site visits
 - Attend local ASP meetings via teleconference



ASP – Antimicrobial stewardship program

TeleHealth ASP Concepts

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Central Support and Data

- **ID pharmacist**
 - Monitor alerts for positive blood cultures, restricted antibiotics, long durations, etc.
 - Drug information and patient questions
 - ID consult identification and referral
- **Resistance data (Antibiogram)**
- **Usage data**
- **ASP projects**
- **Webinar series for education**
- **Regulatory compliance**

ASP – Antimicrobial stewardship program

More on Program Structure and Funding

We have an advantage being part of a system

- Corporate fee charged to each facility
- Access to IT resources, data analysts, micro data

What if you're a free-standing hospital?

- Flex grant funding ([hrsa.gov](https://www.hrsa.gov))
- Research grants (professional organizations)
- State or city collaboratives

Ask yourself:

- Am I close to a School of Pharmacy or Medicine?
- Am I close to a larger facility with ID resources?
- Do I have learners who could assist with the program?
- Am I eligible for any grants?
- Can I participate in a local collaborative?

Core Elements Deep-Dive!

CDC/TJC Stewardship Requirements

1. Leadership commitment
2. Multidisciplinary team (Accountability/Expertise)
3. Tracking
4. Reporting
5. Action
6. Policies/Procedures/Guidelines
7. Education

CDC/TJC Stewardship Requirements

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6. Policies/Procedures/Guidelines
- 7. Education**

Tracking Data – Active Learning Question 1

True/False: My facility tracks data (any data) for antimicrobial stewardship

A. True

B. False

Tracking Data – Active Learning Question 2

What data does your facility track for stewardship?

- A. Antibiotic usage and/or resistance data
- B. Process data (i.e. interventions, adherence to guidelines, etc.)
- C. Clinical outcome data (i.e. mortality, LOS, C.diff rates, etc.)
- D. A and B only
- E. All of the above

Tracking – Antimicrobial Resistance

Intermountain Healthcare						Southern Region Rural Hospitals 2016											ANTIBIOGRAM							
Gram Negative Bacilli % Susceptible																								
# Tests	Species/Organism	Amikacin	Amoxicillin/Clavulanic Acid	Ampicillin	Ampicillin/Sulbactam	Aztreonam	Cefazolin	Cefepime	Cefotaxime	Cefoxitin	Ceftazidime	Ceftriaxone	Cefuroxime	Ciprofloxacin	Ertapenem	Gentamicin	Imipenem	Levofloxacin	Meropenem	Nitrofurantoin**	Piperacillin/Tazobactam	Tetracycline	Tobramycin	Trimethoprim/Sulfamethoxazole
41	Citrobacter freundii	98	0	0	0	95	0	93	85	0	88	88	39	90	100	95	100	93	100	97	98	69	95	78
47	Enterobacter cloacae	96	0	0	0	77	0	87	76	0	79	80	22	100	100	98	100	100	100	47	81	91	98	94
1053	Escherichia coli	98	82	57	61	92	86	93	92	89	92	92	86	78	100	94	100	79	100	96	95	74	94	76
44	Klebsiella oxytoca	98	95	0	64	98	61	95	98	95	98	95	88	98	100	98	100	100	100	82	98	88	98	93
166	Klebsiella pneumoniae	99	86	0	77	92	87	93	92	88	92	92	86	92	99	95	99	95	99	33	95	80	95	81
49	Proteus mirabilis	98	95	76	88	98	90	100	100	98	100	100	98	78	100	86	100	78	100	0	100	5	90	73
76	Pseudomonas aeruginosa	95				82		95			92			82		84	96	82	96		99		96	

Tracking – Antimicrobial Usage

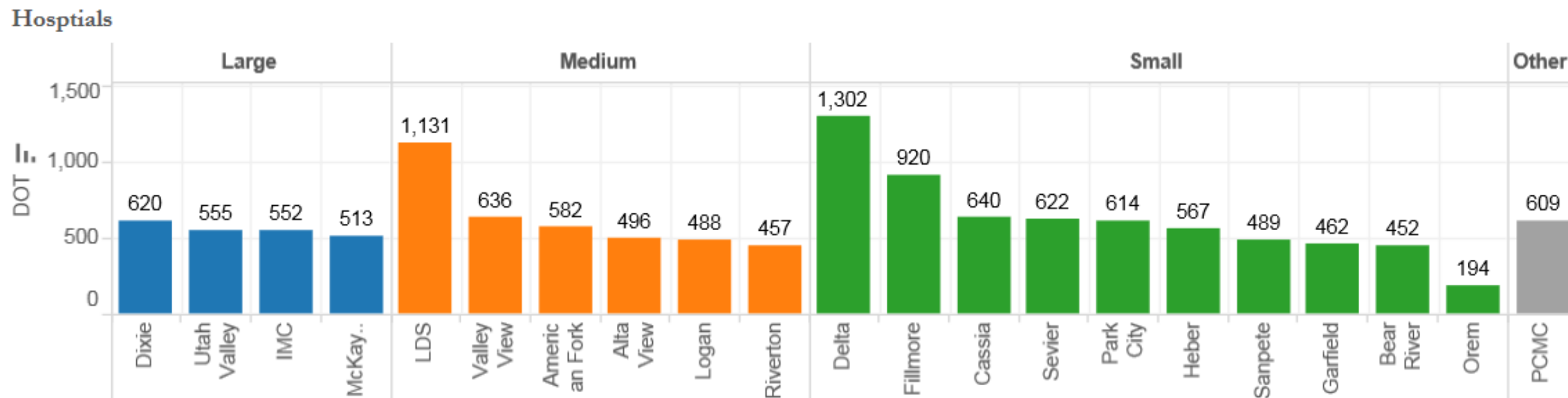
Antibiotic Stewardship Dashboard

Summary Ym

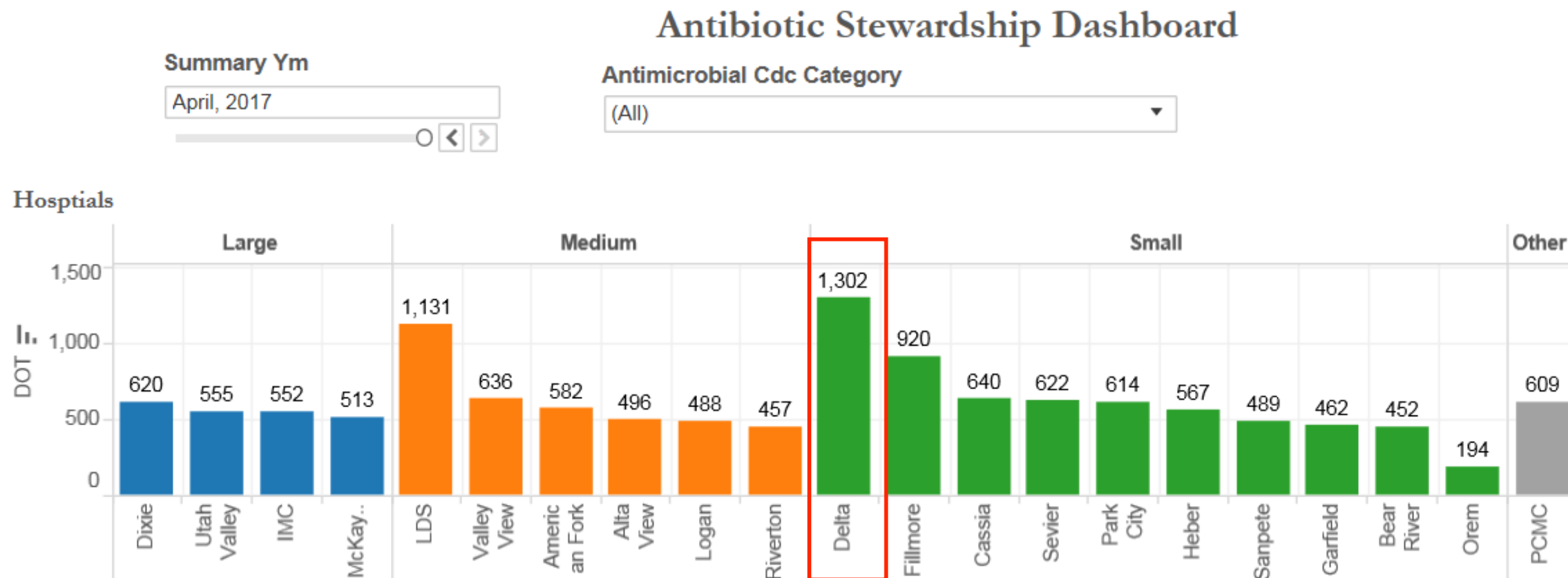
April, 2017

Antimicrobial Cdc Category

(All)

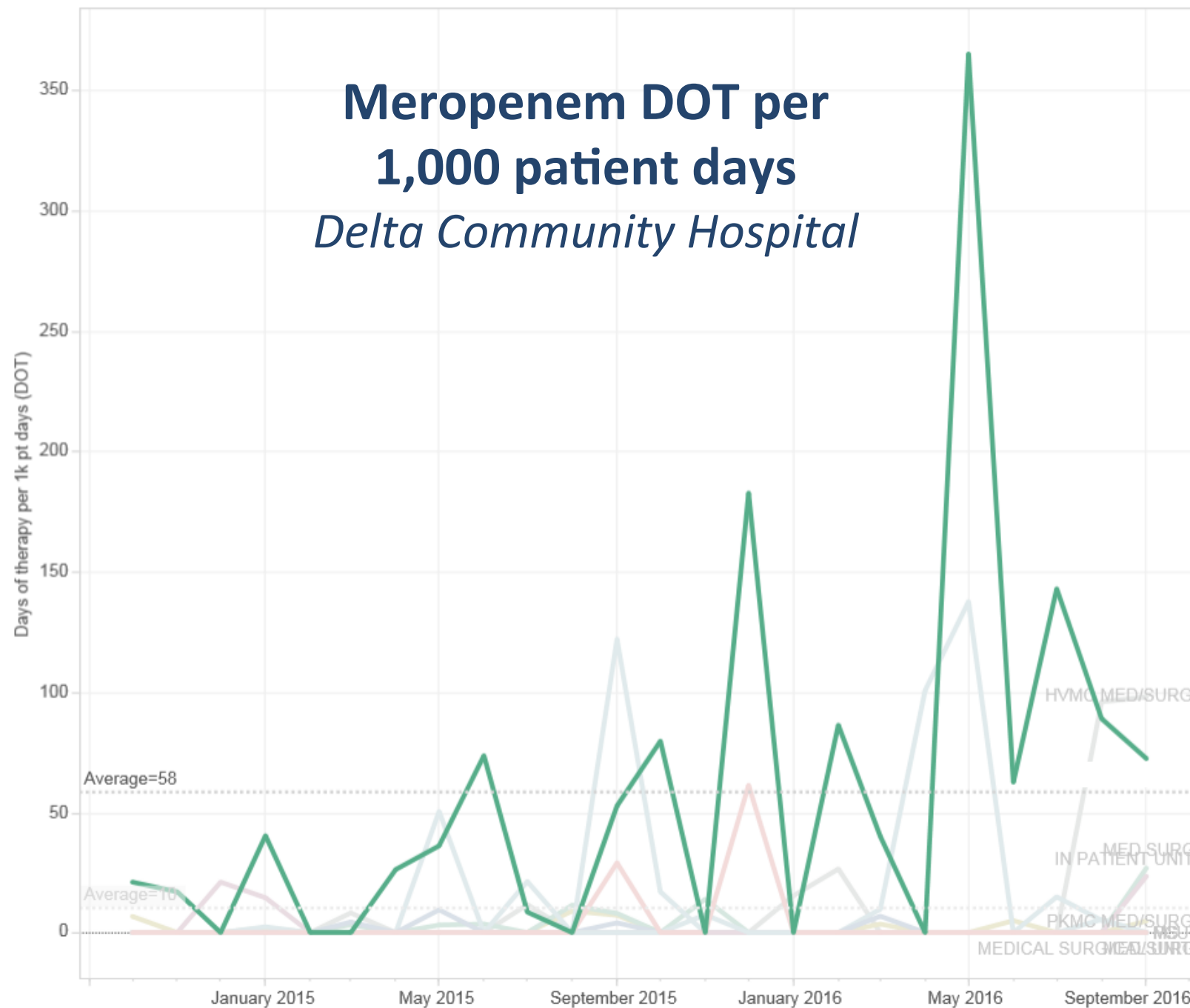


Reporting – How to report data??

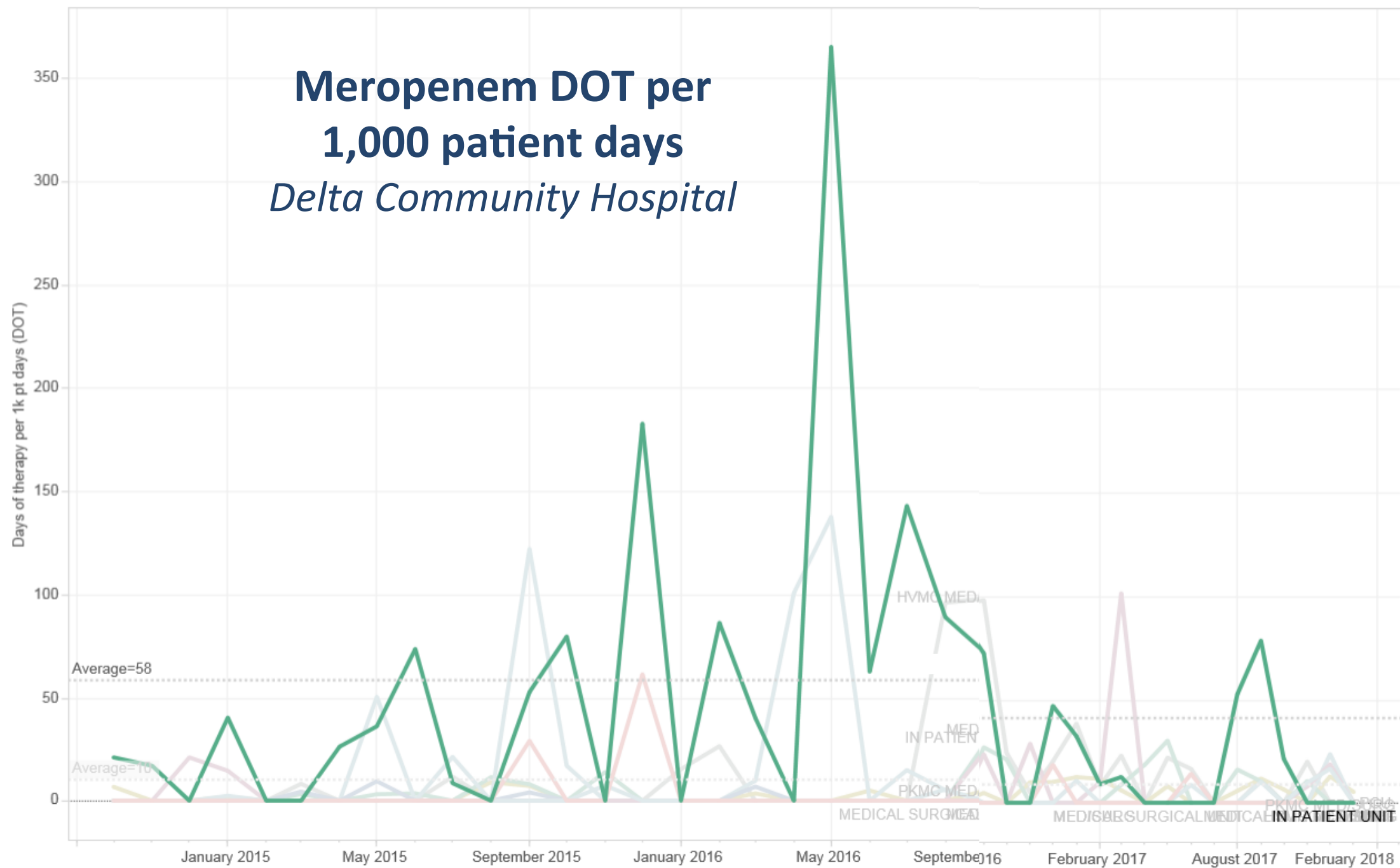


“Well this is clearly disturbing...but what do we do about it?”

Meropenem DOT per 1,000 patient days *Delta Community Hospital*

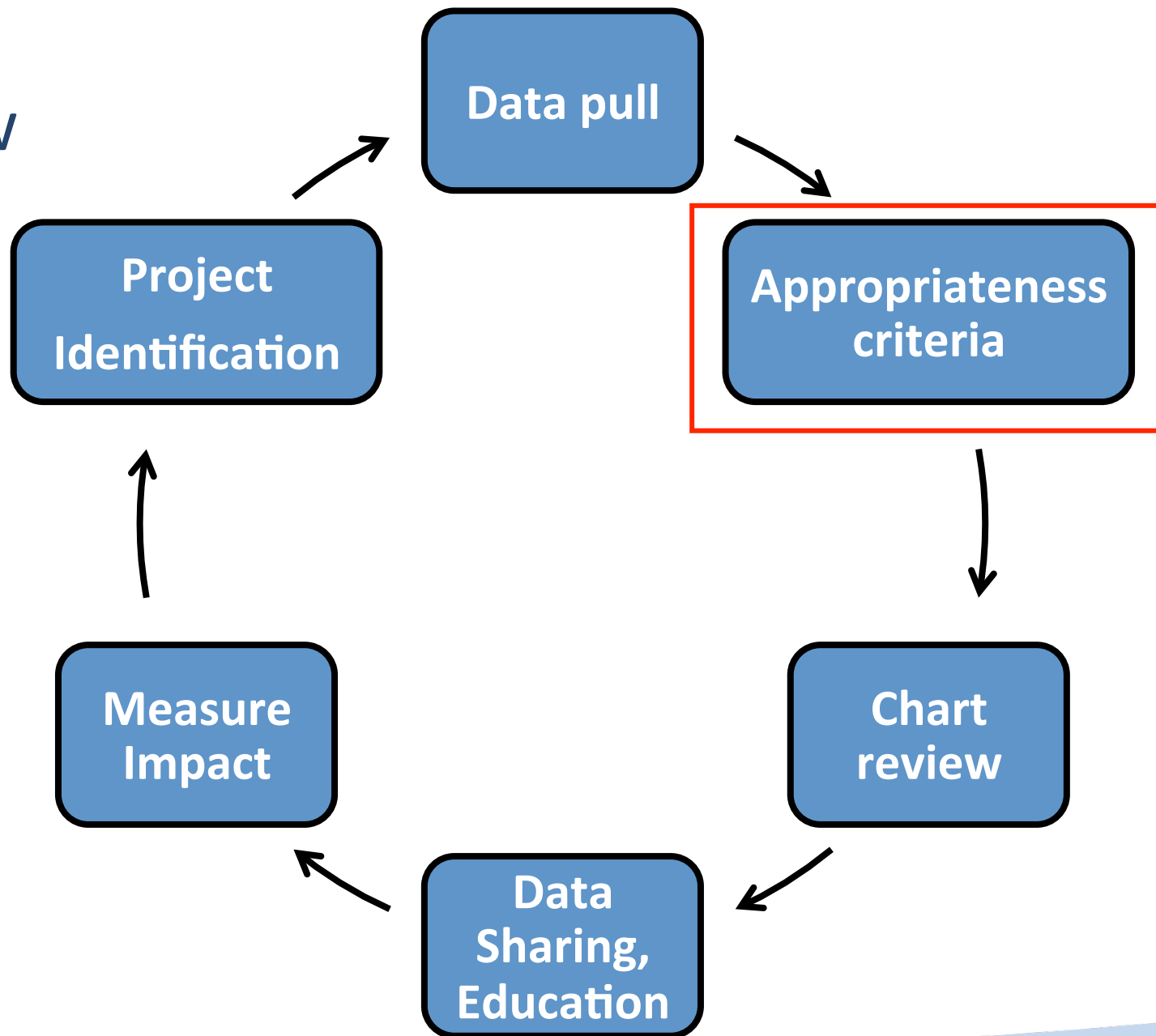


Meropenem DOT per 1,000 patient days *Delta Community Hospital*



ASP Project Workflow

Outlier for
antibiotic usage
-Central data
-Local monitoring



Meropenem Evaluation

Appropriate Use:

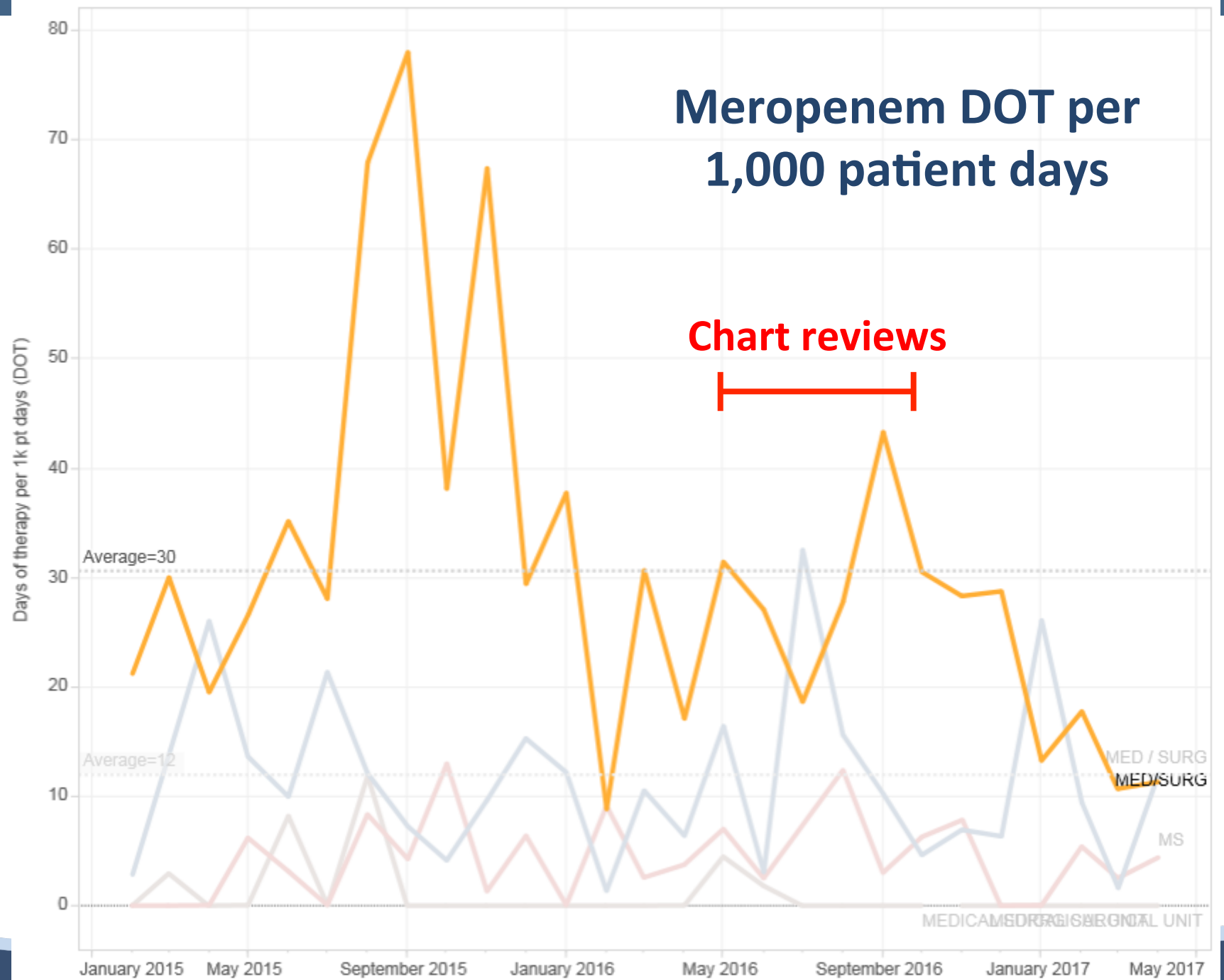
- Severe infection PLUS known/suspected multidrug-resistant organism (MDRO)
 - ESBL
 - AmpC-producing organism (Enterobacter, Citrobacter, Serratia, Acinetobacter)
 - Resistant to piperacillin-tazobactam, ceftriaxone, cefepime
- Allergy/intolerance to 1st line therapy

Inappropriate Use:

- Empiric therapy without MDRO risk factors

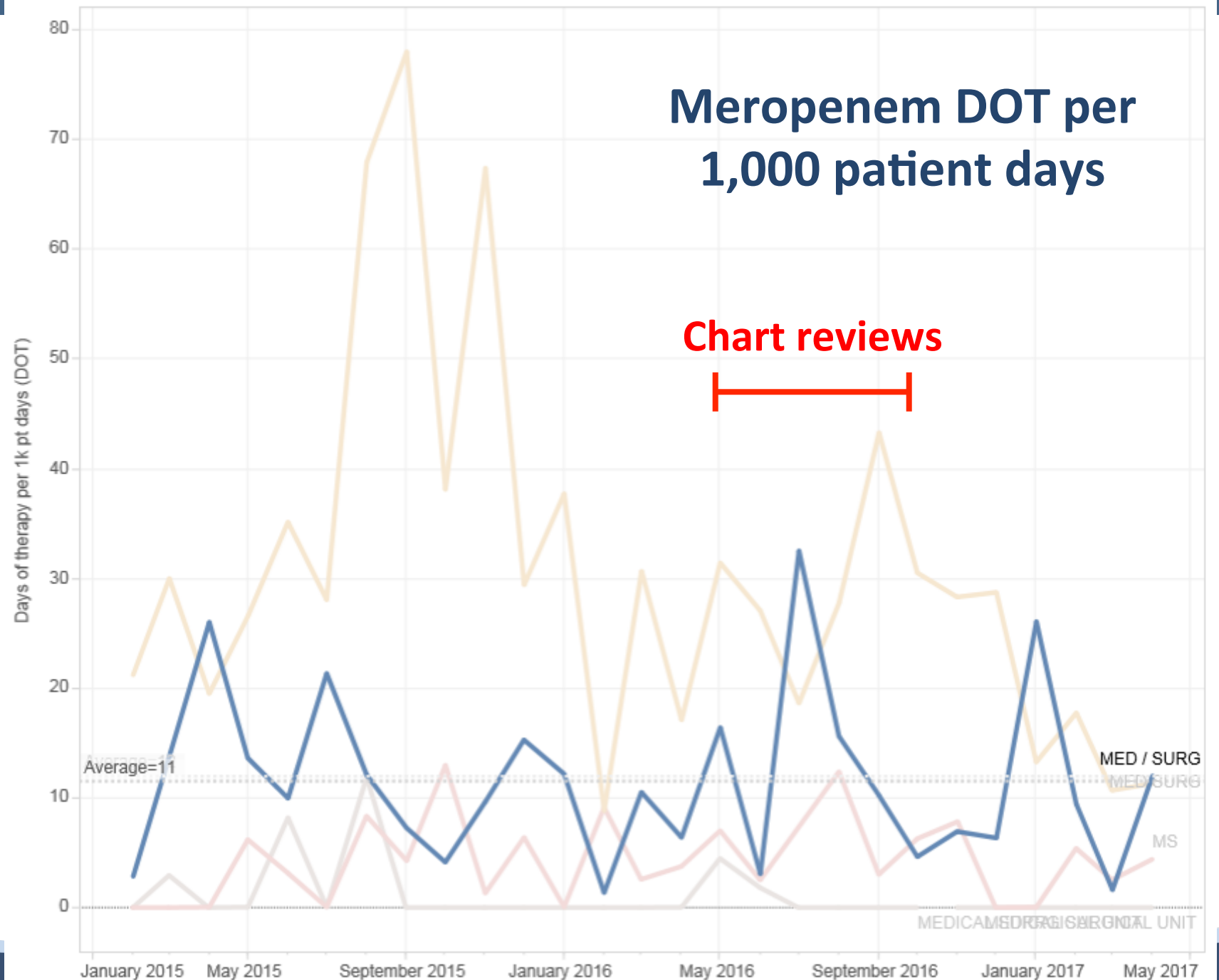
Project Example

- Hospital 1
 - 25% inappropriate meropenem use



Project Example

- Hospital 1
 - 25% inappropriate meropenem use
- Hospital 2
 - 40% inappropriate meropenem use
- Recommendations
 - Use ceftriaxone or pip-tazo unless history of ESBL





Garfield Memorial Hospital: Fluoroquinolone Evaluation

Defined appropriateness criteria

- Community acquired pneumonia, Urinary tract infection

Results and Recommendations (6 months of data)

- Levofloxacin
 - **32 unnecessary days (22%)**
 - Duration of therapy ≤ 7 days for pneumonia
- Ciprofloxacin
 - **78 unnecessary days (30%)**
 - Don't treat asymptomatic bacteriuria
 - Nitrofurantoin for uncomplicated cystitis

Action – What does the ASP do?

Longitudinal interventions

Project Type	Examples	Tracked data	Outcomes
Drug-specific	Meropenem Fluoroquinolones Clindamycin Vancomycin	-DOT or DDD -Cost or # of doses -% appropriate -% unnecessary	-Decrease <u>inappropriate</u> use -Decrease adverse events -Decrease C.diff infections

Support from ID Pharmacist/Physician

- Track/Pull antibiotic order data
- Define appropriateness criteria, data collection form
- Complete chart reviews
- Present data and recommendations to physicians

Time/Resources

+

++

+++

+++

Action – What does the ASP do?

Longitudinal interventions

Project Type	Examples	Tracked data	Outcomes
Process improvement	Allergy documentation Follow-up of ER cultures Bacteremia rapid diagnostics	-# or % appropriate -Time to therapy	-Improve documentation -Decrease ADRs, readmissions -Mortality

Support from ID Pharmacist/Physician

Time/Resources

- Allergies – Literature search, assessment algorithm ++
- ER cultures – Initial education, available for questions ++
- Rapid diagnostics – Lit search, developed protocol, trained staff, ongoing QA ++++

Action – What does the ASP do?

Longitudinal interventions

Project Type	Examples	Tracked data	Outcomes
Infection-specific	CAP, SSTI, UTI Guideline or order set	-% adherence -% appropriate	-Mortality, length of stay, readmissions

Support from ID Pharmacist/Physician

- Defining best practice
- Develop and implement a local guideline
- Monitor adherence, provide feedback to physicians

Time/Resources

+++

++++

++++

Action – What does the ASP do?

Daily interventions

Time/Resources

- Prior authorization / formulary restrictions ++++
- Prospective audit with feedback
 - Positive culture review (Blood and CSF) +++
 - De-escalation, Duration of therapy (48 hour time-out) +++
 - IV to PO conversion +
 - Renal dose adjustment +
 - Drug monitoring (vancomycin, aminoglycosides) ++
 - Allergy verification ++

Taking Action – Active Learning Question 3

Which of the following would be a feasible FIRST stewardship project for an ASP with limited time and resources?

- A. Develop and implement a new local UTI guideline
- B. Establish a new antibiotic restrictions program
- C. Review positive cultures for patients seen in the ER
- D. Screen orders for renal dose adjustment or IV/PO conversion

Education – Active Learning Question 4

Which of the following organizations has free antimicrobial stewardship educational materials posted on its website?

A. CDC

B. IDSA

C. SIDP

Education - Places to Start

Pharmacists

- ASP leaders – Consider formal training or outside support
- Front line staff – Learning modules, didactic lectures, pocket cards, etc.

Nurses

- Pair education with a project (i.e. allergy documentation)
- Help define role in stewardship

Physicians, other prescribers

- **Distribute the local antibiogram**
- **Share tracked data and results of projects**
- Review/feedback on specific cases
- Consider infection-specific education if feasible

Basic Stewardship Education

Video with speakers discussing stewardship

- Rationale for antibiotic stewardship
- The 5 rights for getting an antimicrobial
- Different stewardship strategies
- Development of antibiotic resistance

Education for Antibiotic Best Practices

- When and How to Contact Infectious Diseases
- Antibiotic “Time Out”
- Antimicrobial Indications
- IV to PO Conversion



Advanced Education

Geared towards hospital pharmacists

- Provided interactive learning modules
 - Allergy Verification
 - Anaerobic Coverage
 - Bug-Drug Mismatch
 - De-escalation Guide
 - When to Call Infectious Diseases
- Provided on-site case series discussion

Ongoing stewardship-focused newsletter



SCORE

Optimizing Stewardship in Community Hospitals
1-801-50-SCORE (72673) | score@imail.org

► Antimicrobial Stewardship Checklist—*High*

Print a list of patients on antibiotics for your coverage area. Review each prescribed antibiotic for the following.

Antibiotic Indication

- ☐ Review for *Antimicrobial Indication** and concordance with the *Antimicrobial Prescribing Procedures*.

Antibiotic Restrictions

- ☐ Determine if antimicrobial is a *Restricted Antimicrobial* and follow up pending approvals.

Microbiology

- ☐ Review **microbiology** to evaluate for *Bug-Drug Mismatch*.
- ☐ **For patients with positive clinical cultures only!** Review all patients on vancomycin, imipenem, meropenem, ertapenem, piperacillin/tazobactam, cefepime, aminoglycosides, ceftriaxone, levofloxacin, and/or ciprofloxacin per the *De-escalation* protocol.
- ☐ Determine if there is duplicate or missing treatment for *Anaerobes*.
- ☐ Determine if the syndrome present meets criteria for *When to Consult Infectious Diseases*.

Dose, Route, and Administration

- ☐ Review antimicrobial **dose and frequency** based on indication, patient weight, and patient renal function; refer to *Antimicrobial Dosing Guidelines* for assistance.
- ☐ Review antimicrobial **route** to determine if *IV to PO conversion* should be recommended.
- ☐ Review antimicrobial for **duration**.

* More detail about these procedures is available on the SCORE Study page of Intermountain.net. Search for "SCORE Study" or navigate to Quality and Patient Safety.

Example Intervention-Specific Education: Restrictions

Reviewed antibiogram at each site to determine best empiric coverage

- Chose agents to restrict
- Designed criteria for use
- Approved by central P&T

Education

- Prescribers: staff meeting
- Pharmacists: MyLearning
- Both: posters

Who approved restricted drugs?

- Contact information, logistics

Antibiotics	Antifungals
Daptomycin Linezolid Imi- & meropenem Ceftaroline Tigecycline	Mica- & caspofungin Vori- & posaconazole Amphotericin products



Ceftaroline

Acceptable uses: Restricted to patients requiring: <ul style="list-style-type: none">• Salvage therapy for MRSA bacteremia/endocarditis or other severe MRSA infections• Note: ID consultation is required.	Unacceptable uses: Examples of unacceptable uses: <ul style="list-style-type: none">• Empiric therapy for gram-positive or gram-negative infections• Treatment of skin and soft tissue infections (SSTI) or community-acquired pneumonia (CAP) where other more established and less expensive options are available
Recommended monitoring: <ul style="list-style-type: none">• Weekly CBC and Chem 7. Adjust dose for CrCl <50 mL/min.	

Participate in Webinars!

State Health Department Webinars

CLSI Webinars

CIDRAP Webinars

SIDPEC Webinars

CDC Webinars



EASIE

Education in Antimicrobial Stewardship and Idea Exchange

TUESDAY OCTOBER 17, 2017 12:00 – 12:30

AGENDA

- OVERVIEW OF E.A.S.I.E.
- Antimicrobial Stewardship National Guidance Review
- ASP Project SPOTLIGHT

MEETING ACCESS

WEBEX LINK: [EASIE WEBLINK](#)

- YOU ARE REQUIRED TO REGISTER ON THE WEBEX BEFORE ENTERING THE MEETING
- ACCESS TO WEB RECORDING WILL BE AVAILABLE AFTER THE MEETING

TO JOIN BY PHONE:

- DIAL: 1-801-442-6800
- **MEETING ID #: 624 808 215**

QUESTIONS OR REQUEST: PLEASE EMAIL ANGIE.ADAMS@IMAIL.ORG

Enter questions during the meeting in the WebEx chat box. All questions will be answered after the agenda items have been covered.



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Resources and Wrap-Up

Online Resources

Centers for Disease Control and Prevention

- <https://www.cdc.gov/antibiotic-use/index.html>
- <https://www.cdc.gov/getsmart/healthcare/implementation/core-elements-small-critical.html>

Georgia Department of Public Health

- <https://dph.georgia.gov/antibiotic-stewardship>

Association of State and Territorial Health Officials

Society of Healthcare Epidemiology of America

The screenshot displays the Georgia Department of Public Health (DPH) website. The header includes the DPH logo, the text "Georgia Department of Public Health", and navigation links: "About Us", "Contact Us", "Site Map", and "Translate". A search bar is located on the right. Below the header, a navigation bar contains links: "About DPH", "Contact DPH", "I Want To...", "PH Insider", and "Programs". The main content area is titled "Antibiotic Stewardship" and includes a breadcrumb trail: "Home > Programs > Health Protection > Healthcare Associated Infections > Antibiotic Stewardship". The page text explains that antibiotics have been revolutionary in medicine but their misuse has led to antibiotic resistance. It defines antibiotic stewardship as the practice of ensuring appropriate and judicious use of antibiotics to improve treatment of infectious disease while reducing potential harms from misuse and overuse. A section titled "Inpatient Antibiotic Stewardship Resources" includes a link to the "Georgia Honor Roll for Antibiotic Stewardship". The page also features a "Stay Connected" sidebar with social media icons for RSS, Facebook, Twitter, and YouTube. A left sidebar lists various programs, with "Antibiotic Stewardship" highlighted under the "Healthcare Associated Infections" category.

Nenad Avramovski, MD; Derek Gaul, PharmD, MBA; William James, MHA; Charles Jensen, PharmD; Bruce Jones, PharmD; Jason Lin, PharmD; Geneen Gibson, PharmD, MS

In January 2012, the major health care facilities in Savannah, Georgia collaborated to create a unique city-wide Antimicrobial Management Program (AMP). Memorial University Medical Center and St. Joseph's/Candler Health System were later joined by Select Specialty Hospital (long term acute care)

Savannah's six adult infectious disease (ID) physicians see patients at each of the facilities, which share patient populations, and participate in the AMP by rotating on a weekly basis. The program achieved early success reviewing patients on carbapenems and daptomycin and rapidly incorporated patients receiving one of sixteen targeted anti-infective medications, those on >4 anti-infectives, or with bug-drug mismatches. After comprehensive review by a clinical pharmacist and an ID physician, recommendations are communicated to the responsible prescriber, including other ID physicians

System	Number of Isolates
Vitek 2	0.90
Microscan	1.24
Etest	1.24

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graph TD; MUMC[MUMC Antibiotic Subcommittee] --> SIDP[Savannah Infectious Disease Physicians]; SJCHS[SJCHS Antibiotic Subcommittee] --> SIDP; SIDP --> AMP[MUMC AMP Pharmacist]; SIDP --> AMP_SJCHS[SJCHS AMP Pharmacist]; AMP --> Recs_MUMC[Recommendations Documentation Formulary Analytics Metrics]; AMP_SJCHS --> Recs_SJCHS[Recommendations Documentation Formulary Analytics Metrics]; Recs_MUMC --> Shared[Shared Data & Metrics City Wide Antibigram Educational Resources]; Recs_SJCHS --> Shared;
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Figure 1



Disclosures

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

Dr. Karmali: nothing to disclose; Dr. Glick: nothing to disclose; Dr. Chhabria: nothing to disclose; Dr. Samaan: nothing to disclose; Dr. Alkhalaf: nothing to disclose; Dr. Brown: nothing to disclose.

The integration of competing health systems, all ID physicians, and peer review bolstered the program's credibility and allowed for effective collegial interaction. The growth and influence of the AMP led to shared initiatives across facilities (Fig. 1); inter-facility research, including comparisons of lab susceptibility systems (Fig. 2); development of city-wide metrics; grant awards; and education, including travel to national meetings for microbiologists to evaluate new technologies and address deficiencies. All activities occurred without a negative impact on consultation volume for the ID physicians (Fig. 3)

Year	A	B	C	D
2011	944	1,102	456	416
2012	971	1,104	538	401
2013	836	769	908	545

* Hired in July 2012 ** 3 Groups (Blue, Yellow, Red)

A city-wide antimicrobial management program is able to optimize anti-infective usage to improve patient care, generate regional metrics, expand and improve microbiology procedures, promote research, and provide educational opportunities, without negatively impacting local infectious disease practices

ID Week 2014 – Philadelphia – Oct 9th

<http://www.campsavannah.com/antimicrobial-stewardship-program/>

Roadblocks Encountered

- **Time**

- Pick one project that is a priority to local providers and leaders!

- **Distance**

- Building relationships and trust with local providers and pharmacists

- **Concept of “stewardship” versus “policing/oversight”**

- Provider survey – “I did not appreciate that ID consulted themselves...”



Summary

Innovative stewardship strategies

- Telehealth, multi-hospital collaborative, weekly conference

Tracking/Reporting

- Start by tracking something!
 - Identify outliers or variability in practice
 - Process improvement = low-hanging fruit
- Defining appropriateness leads to more “actionable” data
 - Guidelines or ID practitioners can help

Action

- Consider available time and resources
 - Effort versus impact
 - Work with leadership to accomplish shared goals, identify gaps

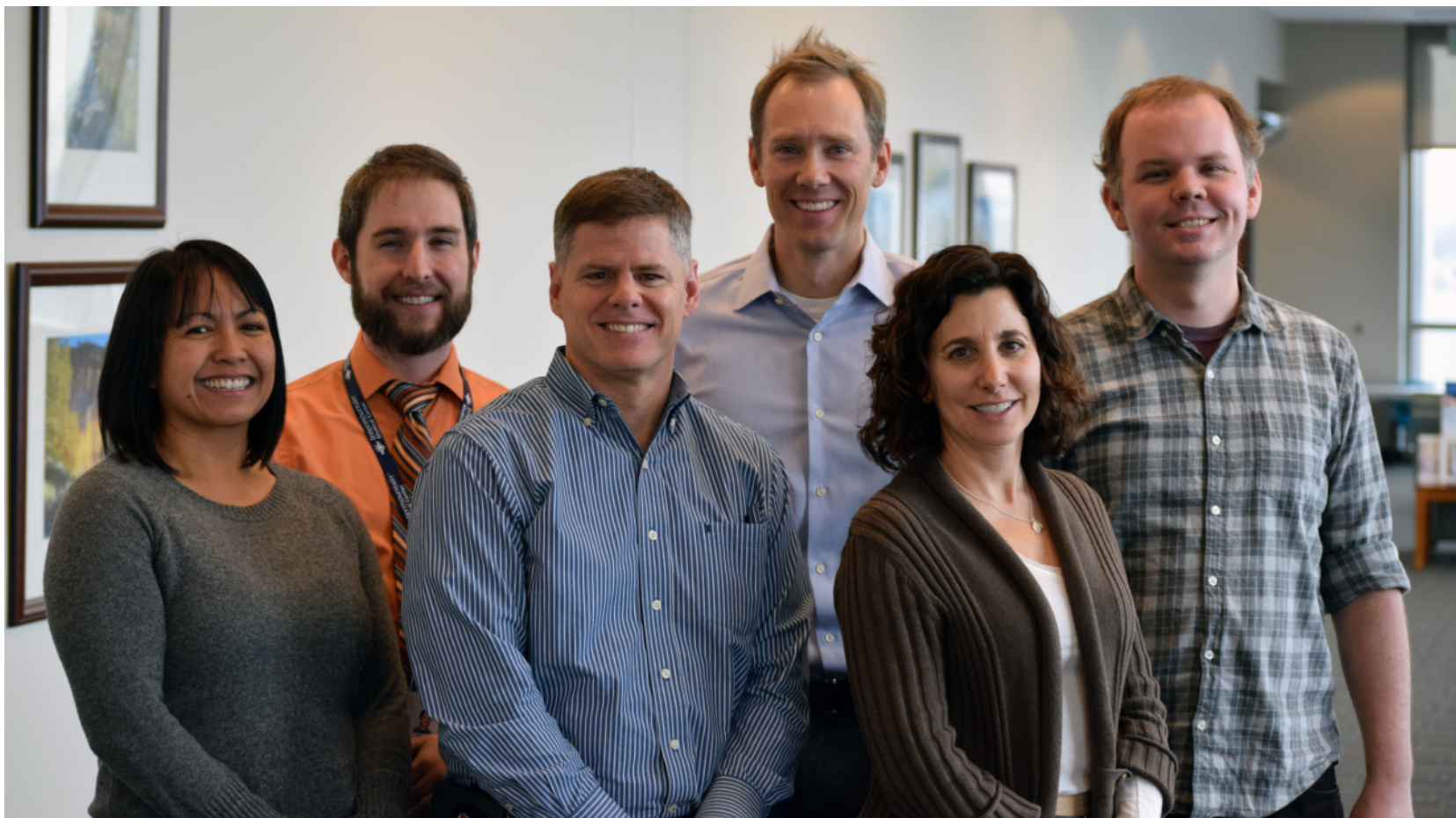
Education

- Antibigram and project results
- Learning modules and webinars
- Decide whom to educate
 - Front-line staff vs ASP personnel
 - Basic versus advanced education

References

- Stenehjem, et al. Stewardship in Community Hospitals—Optimizing Outcomes and Resources (SCORE): A Cluster-Randomized Controlled Trial Investigating the Impact of Antibiotic Stewardship in 15 Small, Community Hospitals. *Open Forum Infect Dis.* 2016;1(S1):S1–68. Abstract 1696. Presented at: ID Week 2016, New Orleans, LA.
- Stenehjem E, et al. Antibiotic Use in Small Community Hospitals. *Clin Infect Dis.* 2016 Nov 15;63(10):1273-1280.
- Stenehjem E, et al. Antibiotic Stewardship in Small Hospitals: Barriers and Potential Solutions. *Clin Infect Dis.* 2017 May 2. doi: 10.1093/cid/cix407.

Acknowledgments



Questions?

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