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(Management Case Study) Antimicrobial Stewardship: Small Hospital Strategies

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Disclosure

- The program chair and presenters for this continuing education activity have reported no relevant financial relationships.

Learning Objectives

- List elements necessary for successful stewardship program based on consensus guidelines.
- Describe two different approaches to development, implementation, and monitoring of stewardship programs in smaller hospitals with limited resources.
- Indicate strategies to report appropriate stewardship metrics.

Self-Assessment Question #1

(True/False). Consensus guidelines state that physician leadership, administrative support and education for health care professionals are all key elements to a successful antimicrobial stewardship program.

A. True

B. False

Self-Assessment Question #2

- (T/F) Education and policy development as well as direct patient interventions are both effective approaches to antimicrobial stewardship.

A. True

B. False

Self-Assessment Question #3

- T/F. Strategies to report antimicrobial stewardship program interventions are well defined in the literature.

A. True

B. False

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Need for Antimicrobial Stewardship Programs (ASPs) is Well Documented

- 2 million illnesses & 23,000 deaths caused by antibiotic-resistant bacteria
- 20-50 percent of all antibiotics are unnecessary or inappropriate (hospital)
- 14-79% inappropriate empiric antibiotic usage, increased mortality (hospital)

CDC 2013 report, http://jointcommission.new-media-release.com/2015_antibiotic_resistance/, Marquet et al, Crit Care. 2015; 19(1): 63.

Consensus Guidelines

- IDSA/SHEA
- CDC Core Elements
- JCAHO

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New Antimicrobial Stewardship Standard

- **Leadership** commitment
- **Accountability** to a multidisciplinary team
- Action - antibiotic time out
- Tracking
- Reporting
- **Education** – Staff, licensed practitioners, patient and family
- Protocols

www.jointcommission.org/assets/1/6/HAP-CAH_Antimicrobial_Prepub.pdf

But- Who says we should *measure* what?

- IDSA-SHEA 2007
  - Recommend “process and outcome measures”
- Joint Commission
  - “Collect, analyze and report data”
- CMS surveyor worksheets
  - Mentor use, review appropriateness
- WHO
  - DDD
- CDC Core Elements Worksheet
  - DOT, DDD, antibiotic spend
- Whitehouse Executive Order (2014)
  - Reduce inappropriate antibiotic use by 20%

The Issue: REPORTING

- Process Measures
  - DOT, DDD, cost, time, appropriate use
- Outcomes Measures
  - LOS, Mortality, C.Diff

- Improved processes = Improved outcomes?
  - Which outcomes?

- Barrier: Clinical response (outcomes) is dependent on **all** aspects of care

Our Hospitals & Clinical Staff

St. Anne Hospital - Toledo, OH

Beds = 98 (~55)
Daily Clinical = 0-4 hrs
Clinical Coordinator

St. Charles Hospital - Oregon, OH

Beds = 250 (~150)
ED = 40 hrs/week
Daily clinical = 16 hrs
Clinical Coordinator
Residents = 1

MERCYHEALTH

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Our Different Initial Approaches….

Trickle-Down Stewardship

Policies and procedures to apply to patients

Trickle-Up Stewardship

Focus on individual patients to develop good policies

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Approach #1
Mercy Health St. Anne Hospital

Jen Richardson, PharmD

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Starting off we “technically” had…

- Order Sets
- Formulary “restriction”
- RPh review of C&S reports/ PNA FISH

How we started - CDC Core Checklist

Pharmacy-driven interventions	**Action performed**		
	Yes	**No**	
Automatic changes from intravenous to oral antibiotic therapy in appropriate situations?	x		8/2016 – policy approved through CMCEC
Dose adjustments in cases of organ dysfunction?	x		
Dose optimization (pharmacokinetics/pharmacodynamics) to optimize the treatment of organisms with reduced susceptibility?		x	
Automatic alerts in situations where therapy might be unnecessarily duplicative?	x		
Time-sensitive automatic stop orders for specified antibiotic prescriptions?		x	
Diagnosis and infections specific interventions	**Action performed**		
	Yes	**No**	
Does your facility have specific interventions in place to ensure optimal use of antibiotics to treat the following common infections?:			
Community-acquired pneumonia		x	In progress
Urinary tract infection		x	In progress
Skin and soft tissue infections		X	
Surgical prophylaxis	x		

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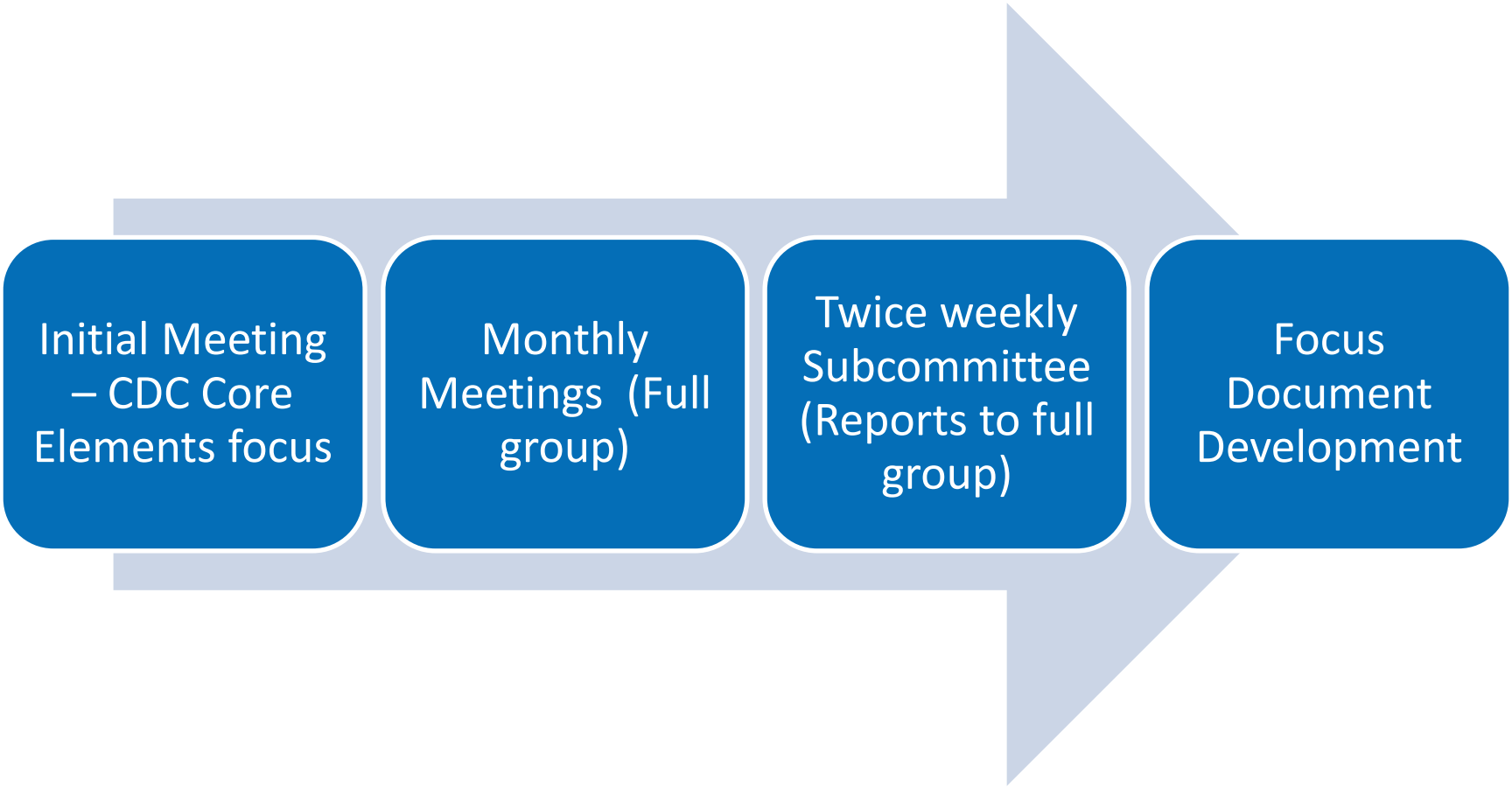
Approach to Team and Structure



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Focus Areas Document (Adult)

FOCUS AREAS:

1) Reduce inappropriate antibiotic use due to contaminated blood cultures
2) Improve use of antimicrobials in pulmonary infections
3) Ensure compliance with guidelines for treatment of urinary tract Infections
4) Improve appropriate antimicrobial therapy for patients discharged from MSAH
5) Promote Surviving sepsis campaign compliance
6) Refine antimicrobial and surgical treatment of skin and soft tissue infections
7) Reduce the incidence of hospital acquired clostridium difficile infections
8) Surgical Site Infections
9) Reduce unnecessary use of broad spectrum antimicrobials
10) Ensure proper treatment of fungal infections

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Focus #1. Reduce inappropriate antibiotic use due to contaminated blood cultures.

Goal 1a: Achieve and maintain goal blood culture contamination rates of 3% or less.

Opportunity/Rationale: Blood culture contamination rates have intermittently been identified as greater than 3%. Identification of true vs. false positives is critical for patient management and population based surveillance. Overresponse to false positive blood culture reports leads to patient overexposure of antimicrobials.

Plan:	Action(s)		Outcomes/Measurements
Monitor baseline and monthly blood culture contamination rates.	X	Integrated Laboratories will report monthly for rates for inpatients and Emergency Department (ED). When goal is reached – reduce report frequency to quarterly.	Started monitoring in Nov 2015. Trendline for both patient areas has continued to decrease, with both areas now currently at goal.
Ensure appropriate ordering and methods for specimen collection/venipuncture	X	Review microbiology policy on specimen collection for compliance with national standards. Policy is up to date.	
	X	Ensure proper Phlebotomy competency. New hire and yearly competency was in place for lab, but ED staff competency was less structured. ED and Lab managers put an additional competency program in place for ED staff.	
	X	Policy changed to include the initials of staff drawing culture to allow for timely feed-back and notification of contaminated cultures	
		Reduce the ordering of blood cultures for patients with a very low likelihood	

Actions– Focus Specific

- Blood Culture Contamination
  - Staff accountability with timely feedback
- Pulmonary Infections
  - Order sets, procalcitonin
  - Specific chart reviews on pulmonary infections (48-72h)
    - “Appropriate use”
  - MD recruitment for recommendation endorsement
- UTI
  - Urinalysis w/reflex on preference lists

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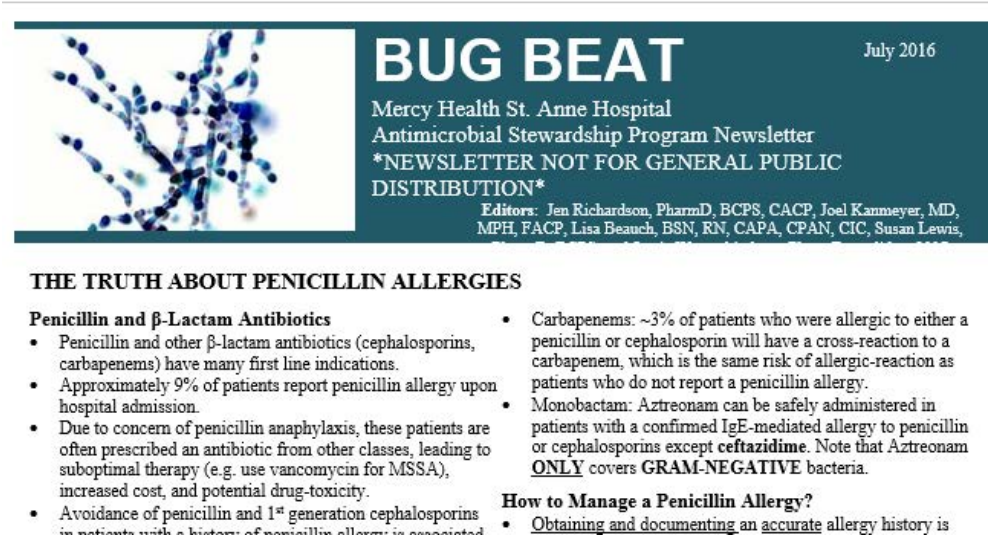
What We Did – Focus Specific

- ABSSSI
  - Dalbavancin in the ED
- Reduce broad spectrum use
  - PCN Allergy testing grant
- Surgery
  - 2 -> 1 post-op doses

Actions - General

- Education
  - Patient flyers, Public postings
  - Quarterly BUG BEAT newsletter
  - Meeting minutes
  - Awareness Activities



BUG BEAT

July 2016

Mercy Health St. Anne Hospital
Antimicrobial Stewardship Program Newsletter
NEWSLETTER NOT FOR GENERAL PUBLIC DISTRIBUTION

Editors: Jen Richardson, PharmD, BCPS, CACP, Joel Kanmeyer, MD, MPH, FACP, Lisa Beauch, BSN, RN, CAPA, CPAN, CIC, Susan Lewis,

THE TRUTH ABOUT PENICILLIN ALLERGIES

Penicillin and β-Lactam Antibiotics

- Penicillin and other β-lactam antibiotics (cephalosporins, carbapenems) have many first line indications.
- Approximately 9% of patients report penicillin allergy upon hospital admission.
- Due to concern of penicillin anaphylaxis, these patients are often prescribed an antibiotic from other classes, leading to suboptimal therapy (e.g. use vancomycin for MSSA), increased cost, and potential drug-toxicity.
- Avoidance of penicillin and 1st generation cephalosporins in patients with a history of penicillin allergy is associated

- Carbapenems: ~3% of patients who were allergic to either a penicillin or cephalosporin will have a cross-reaction to a carbapenem, which is the same risk of allergic-reaction as patients who do not report a penicillin allergy.
- Monobactam: Aztreonam can be safely administered in patients with a confirmed IgE-mediated allergy to penicillin or cephalosporins except **ceftazidime**. Note that Aztreonam **ONLY** covers **GRAM-NEGATIVE** bacteria.

How to Manage a Penicillin Allergy?

- Obtaining and documenting an accurate allergy history is

Staff Educational Efforts – FAIL?

Penicillin Allergy Quiz

1. What percentage of people who report a penicillin allergy actually HAVE a true allergy (when tested)?
    a. 10%
    b. 50%

2. True PCN allergies occur in:
    a. Less than 6 hours
    b. Within 1 week of starting

3. If a patient has a true penicillin allergy, what is the chance they will have a reaction to a cephalosporin?
    a. 65%
    b. 40-50%
    c. 3 to 7%

4. Is cefazolin or vancomycin generally more effective in treating or preventing Methicillin SUSCEPTIBLE *Staphylococcus aureus* (MSSA)
    a. Vancomycin
    b. Cefazolin
    c. Treatment and prevention rates are the same, with vancomycin likely superior

Some pretty charts and graphs…

ID Doc – Rx Agreement

Pharmacy Interventaion for Pulmonary Infection/UTI (Jul/23-Aug/6)							
Pt #	**Disease/Infection**	**Pharmacy Intervention**	**ID Specialist**	**Response**	**Communication**	**Avoidable Dose Days**	
1	COPD/PNA	Duration of Therapy	Agree	Rejected	Written	24	8
2	UTI	De-escalation	Agree	Accepted	Verbal/written		
2	PNA	De-escalation	Agree	Accepted	Verbal/written		
2	PNA	Duration of Therapy	Agree	Accepted	Verbal/written		
3	COPD	De-escalation	Agree	Accepted	Verbal/written		
3	COPD	IV to PO	Agree	Accepted	Verbal/written		
3	COPD	Duration of Therapy	Agree	Rejected	Verbal/written	4	4
4	UTI	De-escalation	Agree	Rejected	Written	2	2
5	UTI	De-escalation	Agree	Rejected	Written	14	7
6	COPD	De-escalation	Agree	Accepted	Written		
6	COPD	IV to PO	Agree	Accepted	Written		
6	COPD	Duration of Therapy	Agree	Accepted	Written		
7	Asthma/Bronchitis	De-escalation	Agree	Accepted	Written		
7	Asthma/Bronchitis	IV to PO	Disagree*	Accepted	Written		
7	Asthma/Bronchitis	Duration of Therapy	Disagree*	Rejected	Written	10	10
8	UTI	De-escalation	Agree	Rejected	Written	3	2
Total						**57**	**33**
				*Would recommend d/c Abx			

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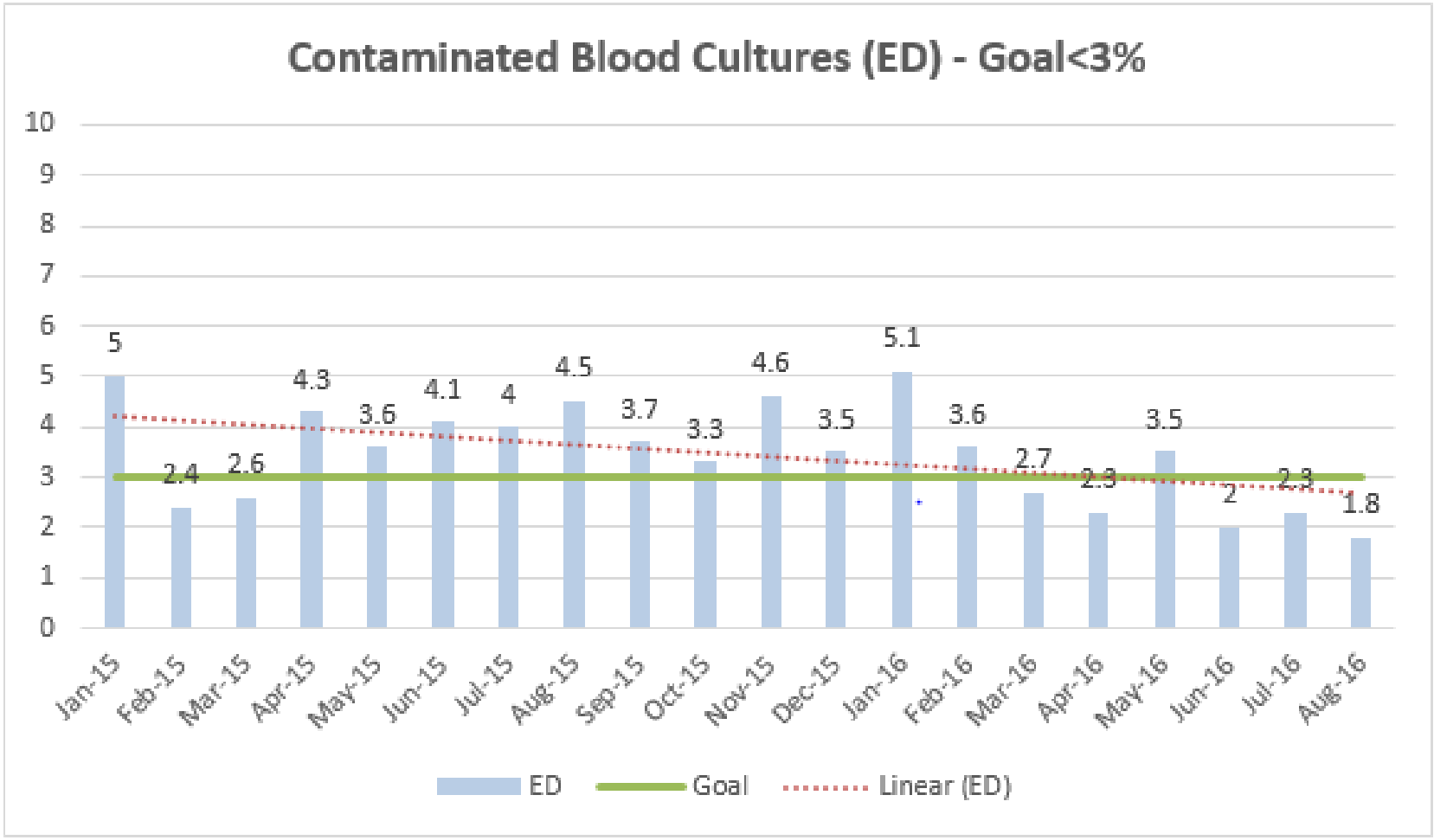

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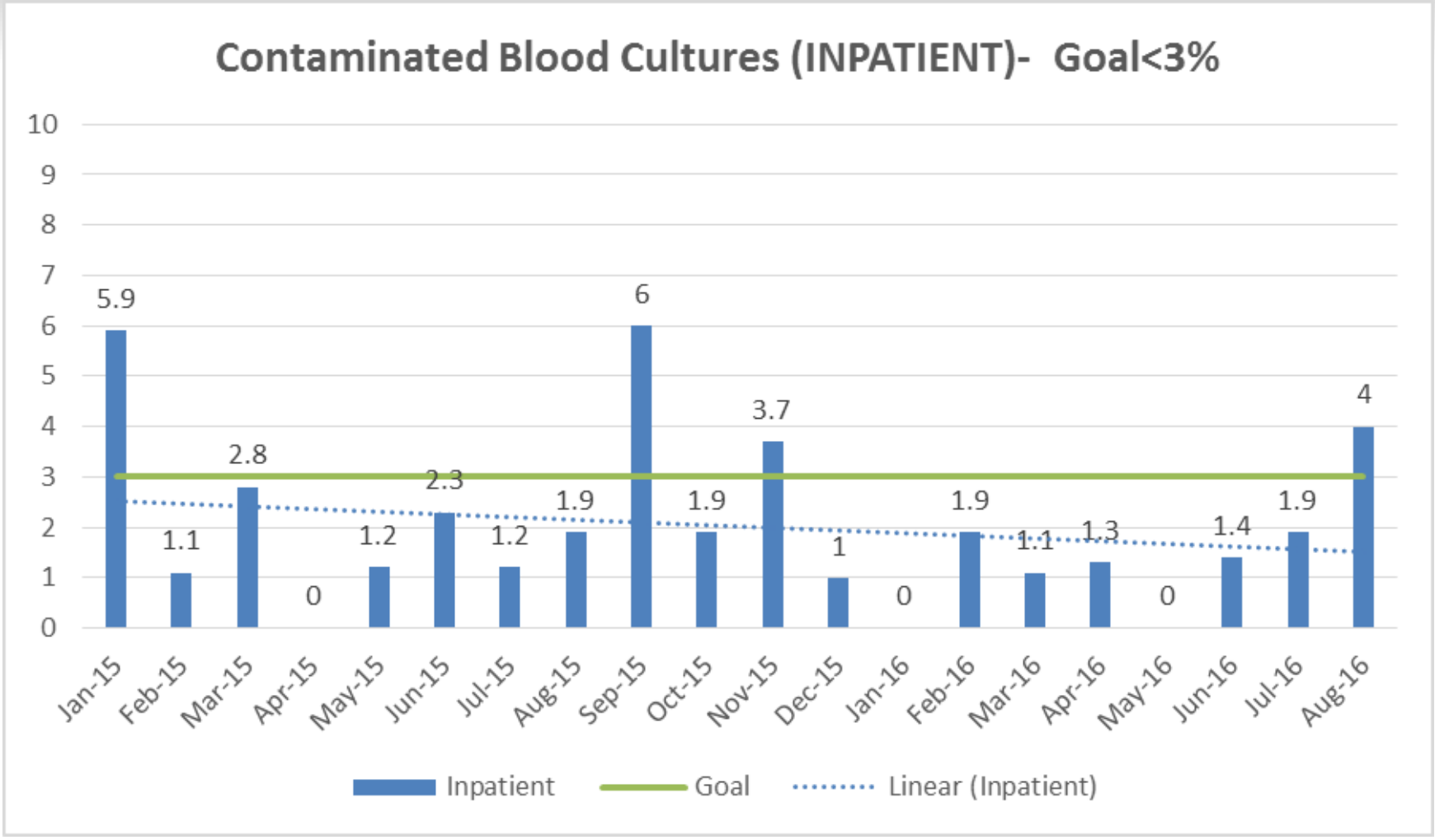

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Blood Culture Contamination Rate = Outcomes?

- In 2015, there were 23 Contaminated blood cultures reported.
  - 4 patients received vanco
    - 17 doses
    - 12 therapy days
  - 1 Additional admission!!!

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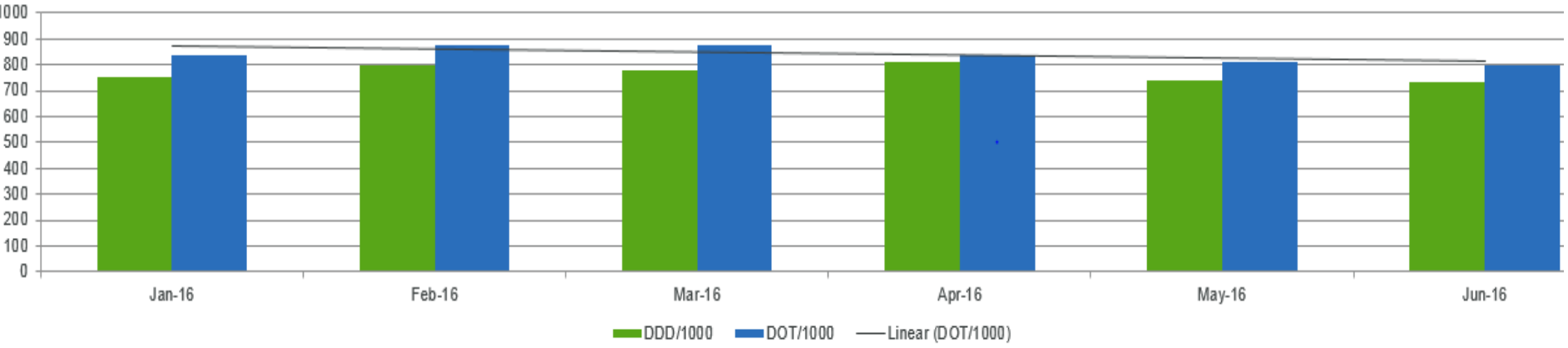
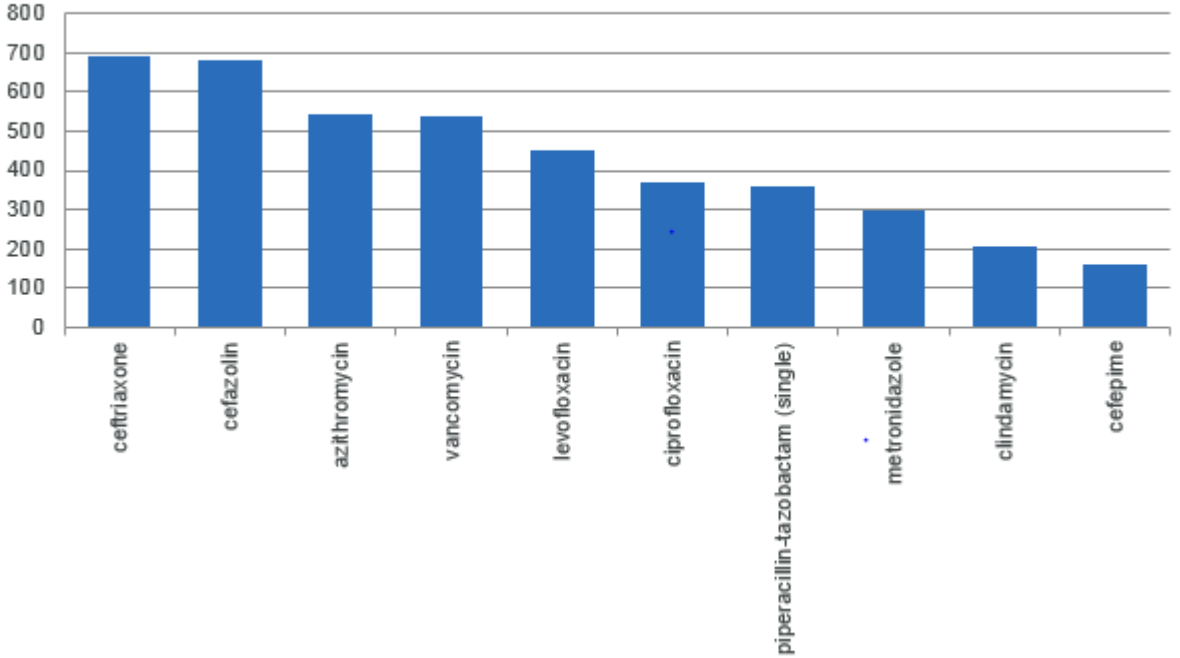
	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	2016 Total
Pharmacy Interventions	3	3	2	6	5	5	8	23		**55**
AMS Metrics										
Injectable Antimicrobials										
DDD/1000 pt days	612.8	672.6	666.1	703.9	626.5	634.4	708.2	706.6		**666.4**
DOT/1000 pt days	675.6	736	742.8	722.7	680.3	686	739.3	733.9		**714.6**
Oral Antimicrobials										
DDD/1000 pt days	152.6	163.7	160.7	135.4	147.6	126.1	192.2	140.2		**152.3**
DOT/1000 pt days	179.4	196.2	188.3	152.5	174	144	209.7	160.1		**175.5**
Total										
DDD/1000 pt days	765.4	836.3	826.8	839.3	774.1	760.5	900.4	846.8		**818.7**
DOT/1000 pt days	855	932.2	931.1	875.2	854.3	830	949	894		**890.1**
Select Broad Spectrum Antibiotic										
Ertapenem										
DDD/1000 pt days	8.6	5	3.3	6.6	3	2.8	4	6.8		**5.0**
DOT/1000 pt days	8.6	5	3.3	6.9	4.1	2.8	4	7		**5.2**
Meropenem										
DDD/1000 pt days	26.4	17.1	14.9	19.6	41.1	11.2	23.1	32.1		**23.2**
DOT/1000 pt days	25.4	19.5	13.2	18.5	37.6	10	24	27.2		**21.9**
Piperacillin/Tazobactam										
DDD/1000 pt days	18.9	29.5	45.8	24.2	44.5	39.6	59.1	39.8		**37.7**
DOT/1000 pt days	37.6	52.3	81.8	44.8	76.6	68.7	99.6	72.7		**66.8**
Vancomycin Inj.										
DDD/1000 pt days	76.7	70.7	95.7	84.3	57.3	.84	95.9	109.8		**84.3**
DOT/1000 pt days	84.9	82.8	99.8	96	63.5	84.2	101	119.2		**91.4**
Inpatient Susceptibility Data*										
S. aureus - Oxacillin % Suceptibile	46%			43%			45%			
E Coli - Cipro % Susceptibile	65%			72%			72%			
Pseud - Pip/Tazo % Susceptibile	94%			94%			93%			
Pseud - Cefepime % Susceptibile	100%			100%			100%			
Spend Data										
Antimicrob $$/WEIPA (2015: $22.01)	$24.59	$24.06	$17.73	$21.22	$20.55	$16.11	$16.42	$17.68		**$ 19.80**

Total Drug Utilization



DOT/1000



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C. Diff Efforts

Environment

- UV Lights
- Curtains
- “Trouble” rooms identified
- Staff movements

Pharmacy

- Auto D/C of PPIs (7/16)
- IV to PO (7/16)
- New case med review
- Antimicrobial de-escalation

No, we are not routinely using probiotics

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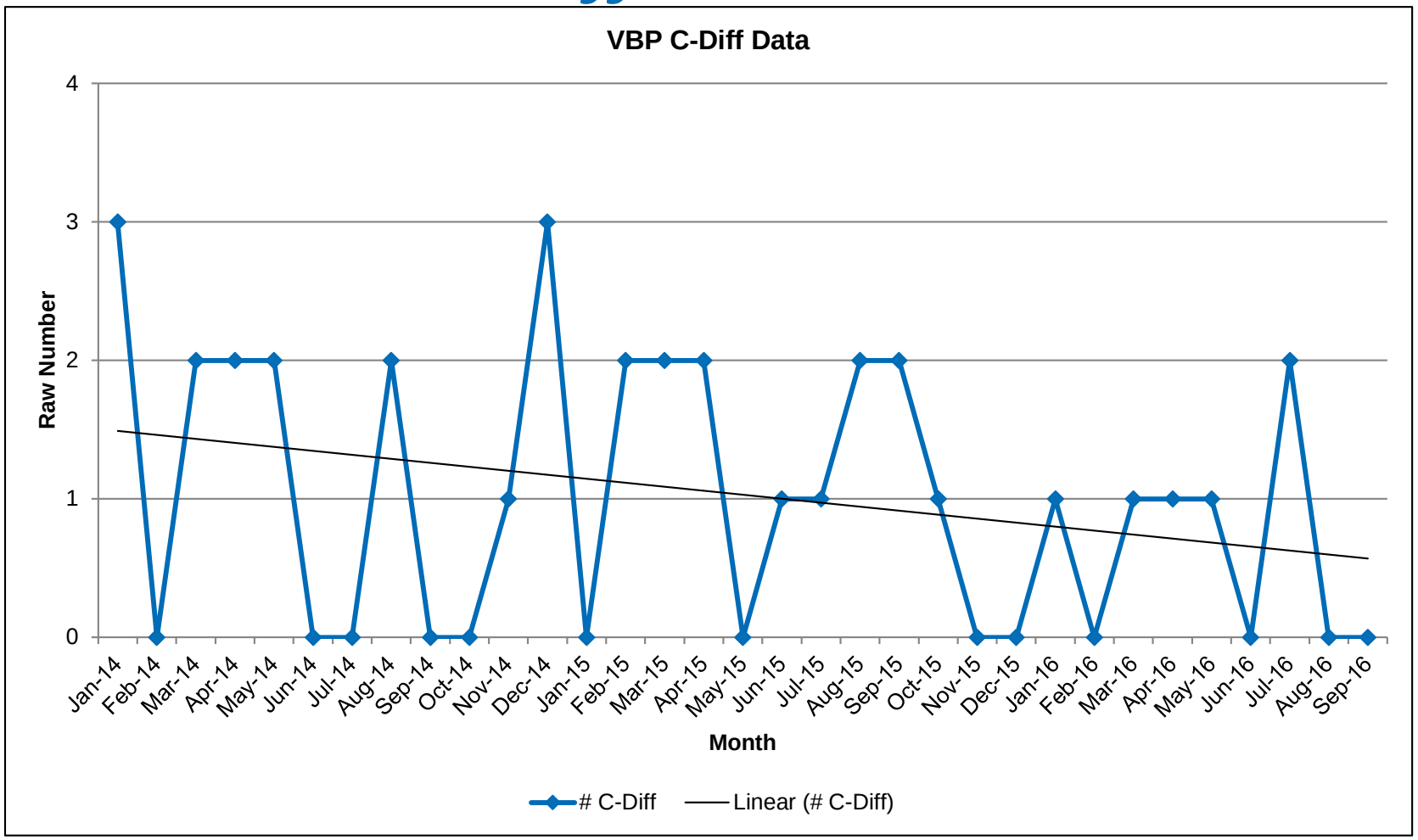
NHSN – CDC Reporting

(Housewide)	1st QTR	2ng QTR	3rd QTR	4th QTR	2015	Jan	Feb	Mar	Apr	May	June	2016
Number of NHSN reported infections	2	1	2	0	13	1	0	1	1	1	0	4
NHSN number of expected infections by quarter	3.819	3.864	3.645	3.791	15.120			4.156			4.030	8.186
Denominator	1838	1692	1808	1742	20858	1826	1610	1696	1552	1593	1514	9791
Rate (# of inf/ pt days * 10000)	10.88	5.91	11.06	0.00	6.23	5.48	0.00	5.90	6.44	6.28	0.00	4.09
NHSN SIR	1.047	0.776	1.372	0.264	0.860			0.481			0.496	0.489

National Health and Safety Network

C.Diff - St. Anne



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Rapid Organism Identification

Timely info → Timely response!

- PNA FISH

- Coming Soon? MALDI-TOF (mass spectrometry)
  - Results <15 minutes vs. 5-48 hours

MERCYHEALTH

Approach #2
St. Charles Hospital

Lauryl Hanf-Kristufek, PharmD, BCPS, CACP

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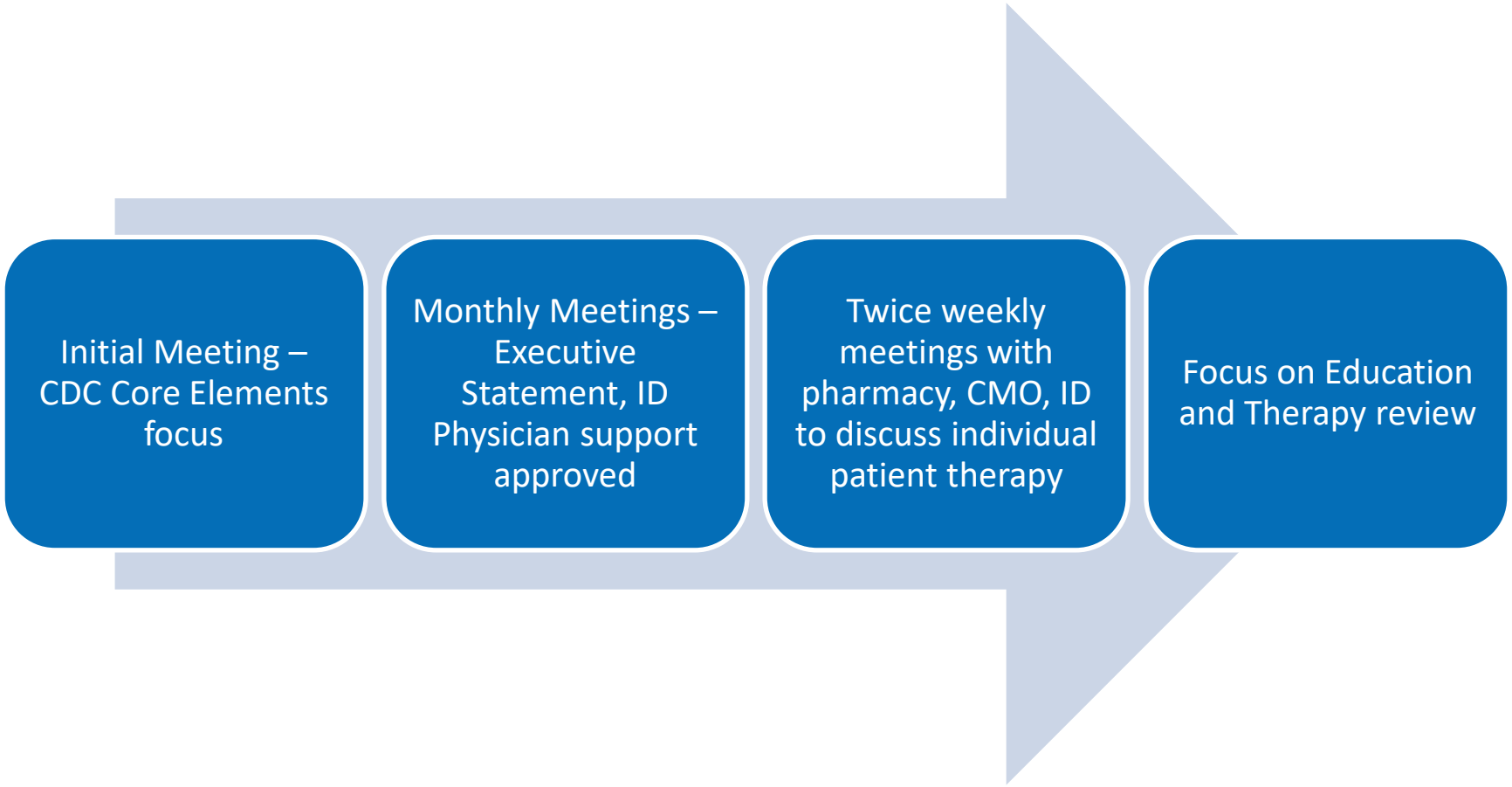
Approach to Team and Structure



CMO – Chief Medical Officer

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AMS Examples from St. Charles

- Development of formal Antimicrobial stewardship committee
  - ID physician, CMO, pharmacy, infection control, lab, quality, nursing, environmental services
  - Monthly meetings
  - CDC Core Checklist

SPECIFIC INTERVENTIONS TO IMPROVE ANTIBIOTIC USE *Are the following actions to improve antibiotic prescribing conducted in your facility?*	
BROAD INTERVENTIONS	**ACTION PERFORMED**
C. Is there a formal procedure for all clinicians to review the appropriateness of all antibiotics 48 hours after the initial orders (e.g. antibiotic time out)?	❑ Yes ❑ No
D. Do specified antibiotic agents need to be approved by a physician or pharmacist prior to dispensing (i.e., pre-authorization) at your facility?	❑ Yes ❑ No
E. Does a physician or pharmacist review courses of therapy for specified antibiotic agents (i.e., prospective audit with feedback) at your facility?	❑ Yes ❑ No

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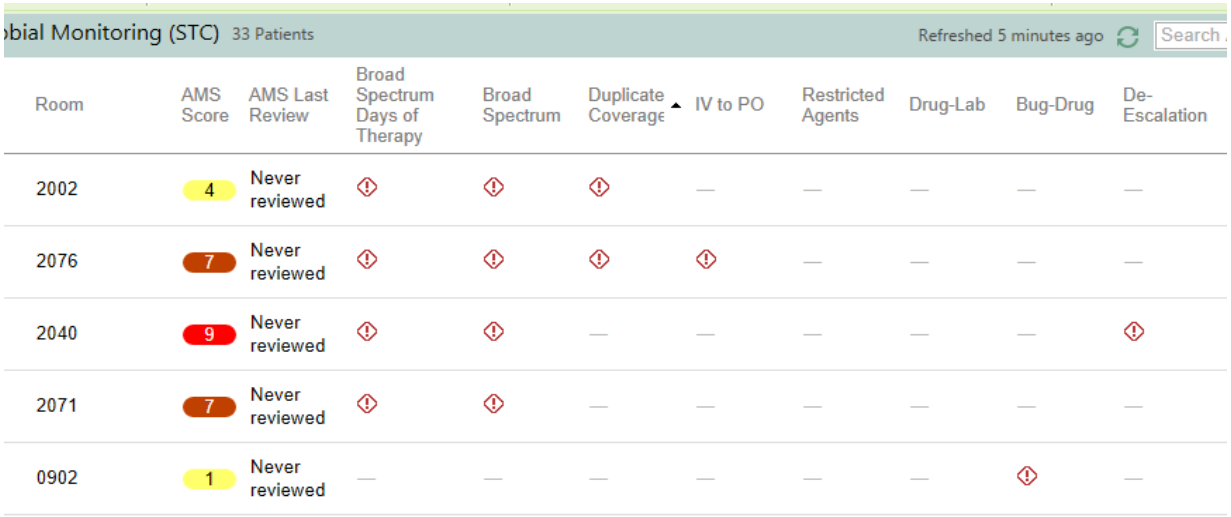
AMS Examples from St. Charles

- Antimicrobial use review
  - Twice-weekly review by ID physician, CMO and pharmacist with direct recommendations to prescribers
  - Daily by decentralized clinical pharmacists
  - Review of all positive cultures
  - Automatic IV to PO and renal dosing policy



obial Monitoring (STC) 33 Patients — Refreshed 5 minutes ago — Search

Room	AMS Score	AMS Last Review	Broad Spectrum Days of Therapy	Broad Spectrum	Duplicate Coverage	IV to PO	Restricted Agents	Drug-Lab	Bug-Drug	De-Escalation
2002	4	Never reviewed	⚠	⚠	⚠	—	—	—	—	—
2076	7	Never reviewed	⚠	⚠	⚠	⚠	—	—	—	—
2040	9	Never reviewed	⚠	⚠	—	—	—	—	—	⚠
2071	7	Never reviewed	⚠	⚠	—	—	—	—	—	—
0902	1	Never reviewed	—	—	—	—	—	—	⚠	—

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AMS Metrics

	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	2016 Total
Pharmacy Interventions									
Total	74	83	103	101	85	102	107	85	548
AMS Metrics									
Injectable Antimicrobials									
DDD/1000 pt days	320.3	344.2	373.7	349.6	320.4	277.7	278.4	261.2	331.0
DOT/1000 pt days	322.9	372.8	382	362.6	330.1	288.2	301.9	278.3	343.1
Oral Antimicrobials									
DDD/1000 pt days	137.2	148.9	157.1	170.2	137.5	140.3	133.4	110.7	148.5
DOT/1000 pt days	151	167.4	175.1	175.7	149.9	144.6	138.6	125.1	160.6
Total									
DDD/1000 pt days	457.5	493.1	530.8	519.8	457.9	418	411.8	371.9	479.5
DOT/1000 pt days	473.9	540.2	557.1	538.3	480	432.8	440.5	403.4	503.7
Susceptibility Data*									
Inpatient									
Staph aureus - Oxacillin % Suceptibile	36%			39%			43%		
E Coli - Cipro % Susceptibile	67%			69%			67%		
Pseud - Pip/Tazo % Susceptibile	92%			92%			89%		
Pseud - Cefepime % Susceptibile	92%			92%			93%		
Spend Data									
Antimicrobial Spend/WEIPA (2015: $26.99)	$ 21.23	$ 13.43	$ 19.06	$ 17.68	$ 12.66	$ 15.07	$ 18.34	$13.65	$ 16.78
Antimicrobial savings	$10,806.39	$26,116.61	$17,461.07	$18,638.29	$31,074.73	$23,702.37	$18,517.63		$146,317.08

AMS Examples from St. Charles

- General Staff Education
  - Pneumonia, sepsis, cellulitis, UTI, stewardship
  - Physician Grand Rounds
  - Nursing Grand Rounds
  - Resident lectures
- Pharmacy Newsletters
- Educational Flyers

AMS Examples from St. Charles

- Antibiogram
  - Printed version
  - Educational information on back
  - Reviewed with incoming residents

Mercy Health - St. Charles Hospital Test period Jan 2015 thru Dec 2015 Percent of In-Patient isolates Susceptible to the following antibiotics:	Total # tested	Ampicillin	Cefazolin	Cefepime	Ceftriaxone	Ciprofloxacin	Clindamycin	Erythromycin	Gentamicin	Levofloxacin	Meropenem	Methicillin	Penicillin	Pip/Tazobactam	Tetracycline	TMX/SMX	Vancomycin	Nitrofurantoin~
GRAM NEGATIVE																		
Enterobacter cloacae	11 #				81	72			90							72		
Escherichia coli (7% ESBLs)	165	49	83		90	66			90					97		75		92
Klebsiella pneumoniae (5 % ESBLs)	41		95		85	85			95					85		80		36
Proteus mirabilis	15 #	93	90		93	53			66							80		
Pseudomonas aeruginosa	25 #			92		68			80		95			92				
GRAM POSITIVE																		
Staphylococcus aureus (**MSSA**)	41						78	54	100						93	100	100	
Staphylococcus aureus (**MRSA**) ¤	71						61	13	92						87	84	100	
Coagulase-negative Staph	29 #						47	23	65			34			65	37	100	
Enterococcus, ALL isolates (11% VRE)	78	76															79	72
Streptococcus pneumoniae (meningitis interpretations)	8 #				100					100			75				100	
Streptococcus pneumoniae (nonmeningitis interpretations)					100					100			100				100	

\# *The calculation for percent susceptibility has less statistical validity for organisms with fewer than 30 isolates.*
~ only reported on urinary tract isolates
¤ MRSA = 64% of Staph aureus isolated.

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Antibiogram
St. Charles Hospital

Community-acquired pneumonia (CAP) in hospitalized patients

Empiric Treatment

Patient NOT in ICU
- Ceftriaxone 1G IV Q24h **PLUS** Azithromycin 500mg IV/PO Q24h
- Levofloxacin 750mg IV/PO Q24h
- Duration of treatment 7-8 days[1]

Patient in ICU
- Ceftriaxone 1G IV Q24h **PLUS** Azithromycin 500mg IV Q24h
- Ceftriaxone 1G IV Q24h **PLUS** Levofloxacin 750mg IV Q24h
- (If Allergy to Beta-Lactam antibiotics) Meropenem 1G IV Q8h **PLUS** Azithromycin 500mg IV Q24h **PLUS** Tobramycin 5mg/kg IV Q24h
- Duration of treatment 7-8 days[1]

Patient in ICU with risk of pseudomonas
(structural lung disease (i.e. bronchiectasis), corticosteroid use, broad-spectrum antibiotics for > 7 days in the past month, COPD)
- Ciprofloxacin 400mg IV Q12h **PLUS** Piperacillin/Tazobactam 3.375G IV Q8h
- Azithromycin 500mg IV Q24h **PLUS** Tobramycin 5mg/kg IV Q24h **PLUS** Piperacillin/Tazobactam 3.375G IV Q8h
- Azithromycin 500mg IV Q24h **PLUS** Tobramycin 5mg/kg IV Q24h **PLUS** Meropenem 1G IV Q8h
- Duration of treatment 10-14 days[1]

[1]Depending on patient response/symptoms

Bacterial urinary tract infections (UTI)

Asymptomatic bacteruria
(Positive urine culture ≥ 100,000 CFU/ml with no Signs or symptoms)
NO treatment unless the patient is:
- Pregnant
- Scheduled to have an urologic procedure
- Post renal transplant
- Neutropenic

Acute cystitis
(Signs and symptoms (e.g. dysuria, urgency, frequency, suprapubic pain AND positive urine culture ≥100,000 CFU/ml AND pyuria (> 10 WBC/hpf)

Uncomplicated:
- Nitrofurantoin 100mg PO Q12h x 5 days
- TMP/SMX 1 DS tab PO Q12h x 3 days
- Cephalexin 500mg PO Q6h x 5-7 days
- Cefazolin 1G IV Q8h x 5-7 days
- Duration of treatment 3-7 days[1]

Complicated:
- Ciprofloxacin 400mg IV Q12h
- Ceftriaxone 1G IV Q24h
- Duration of treatment 7 days[1]

Cellulitis

Non-purulent
(Moderate to Severe)
- Cefazolin 1G IV Q8h
- (PCN allergy) Clindamycin 600mg IV Q8h

(History of MRSA or high risk for MRSA)
- Vancomycin 15mg/kg IV Q12h (Pharmacy to dose)
- Duration of treatment 5-7 days[1]

Clostridium Difficile (C. Diff)
- 3 loose stools within 24hr w/symptoms
- Consider alternative cause of diarrhea
- No solid stool samples tested
- Do not test patients with history of C. Diff if loose stools and symptoms are not present or after only one loose stool
- Do not test to confirm eradication
- Duration of treatment 10-14 days with at least 7 days post other antibiotics[1]

Mild/Moderate
(WBC ≤ 15,000 cells/mm^3 **AND** SCr < 1.5 x baseline)
- Metronidazole 500mg IV/PO Q8h
- Vancomycin 125mg PO Q6h

Mod/Severe
(WBC > 15,000 cells/mm^3 **OR** SCr ≥ 1.5 x baseline)
- Vancomycin 125mg PO Q6h

Severe, complicated
(Hypotension, Shock, Ileus, or Megacolon)
- Vancomycin 500mg PO Q6h AND Metronidazole 500mg IV Q8h

Recurrence
1st recurrence •repeat initial therapy
2nd or more recurrence •Vancomycin oral taper

Cellulitis

Purulent
(Mild to Moderate)
- Doxycycline 100mg po BID
- Clindamycin 300mg PO Q8h
- Clindamycin 600mg IV Q8h

(Severe)
- Vancomycin 15mg/kg IV Q12h (Pharmacy to dose)
- •••Duration of treatment 7-14 days[1]

Interpreting the microbiology report

Gram-positive cocci

Aerobic
In clusters
- Coagulase (+): *S. aureus*
- Coagulase (-): *S. epidermidis, S. lugdunensis*

In pairs / chains
- Diplococcus, Quellung positive: S. pneumoniae
- Alpha-hemolytic: Viridins group *Streptococci, Enterococcus (faecalis and faecium)*
- Beta-hemolytic: Group A strep (*S. pyogenes*) Group B strep (*S. agalactiae*) Group C, D, G strep

Anaerobic: *Peptostreptococcus spp.*

Gram-negative cocci

Aerobic
Diplococcus: *N. meningiditis, N. Gonorrhoeae, Moraxella catarrhalis*
Cocco-bacillus: *H. flu, Acinetobacter Spp.,* HACEK organisms

Anaerobic: *Veillonella spp.*

Gram-positive rods

Aerobic
Large: *Bacillus spp.*
Cocco-bacillus: *Listeria monocytogenes, Lactobacillus spp.*
Small, pleomorphic: *Corynebac-terium spp.*
Branching filaments: *Nocardia spp, Streptomyces spp.*

Anaerobic
Large: *Clostridium spp.*
Small: pleomorphic: *P. acnes, Actinomyces spp.*

Gram-negative rods

Aerobic
Lactose fermenting: *Citrobacter spp., Enterobacter spp., E. coli, Klebsiella spp., Serratia app.*
Non-lactose fermenting
- Oxidase (-): *Acinetobacter spp., Burkholderia spp.,E. coli (rare), Proteus spp., Salmonella spp., Shigella spp., Serratia spp., Stenotrophomonas maltophilia*
- Oxidase (+): *P. aeruginosa, Aeromonas spp., Vibrio spp., Campylobacter spp. (curved)*

Anaerobic: *Bacteroides spp., Fusobacterium spp., Prevotella spp.*

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AMS Examples from St. Charles

- Focus on *C. Diff*
  - Daily review of all positive *C. Diff* testing with documentation of appropriate treatment
  - Development of *C. Diff* order set
  - Education on appropriate *C. Diff* testing
  - Automatic stop after 48hrs if no sample obtained
  - Automatic extension of duration by RPh

If it's not loose, it's of no use!

Clostridium difficile testing guidance:

The diagnosis of *Clostridium difficile* infection (CDI) requires the detection of bacterial toxin and/or antigens in the stool. Newer diagnostic tests for CDI require less stool testing without sacrificing diagnostic accuracy. To increase the sensitivity of CDI diagnosis Mercy St. Charles uses the DNA amplification test for *C. difficile* which is highly sensitive and highly specific.

Aside from improved test characteristics, selecting the most appropriate patient population for testing will enhance the sensitivity and specificity of diagnosing CDI.

To facilitate enhanced diagnostic practices, the following recommendations are made:

1.) Testing for *C. difficile* should be performed on patients with **clinically-significant diarrhea, defined as 3 or more loose stools in the last 24-hours**. Providers should ensure that the patient has not been administered laxatives in the prior 24-48hrs as a possible explanation of diarrheal symptoms.

2.) Testing is **only performed on loose or watery stool** specimens. The microbiology lab will reject any formed

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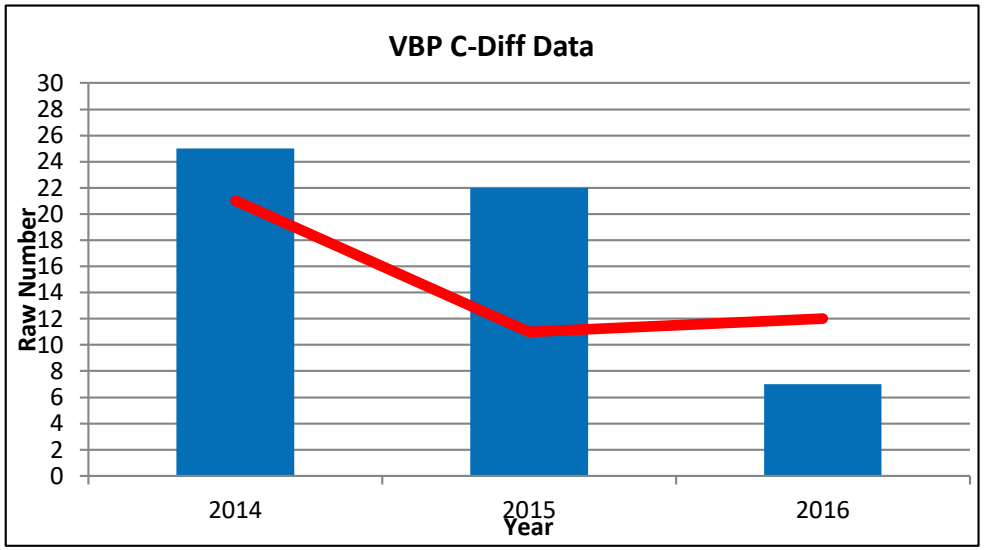
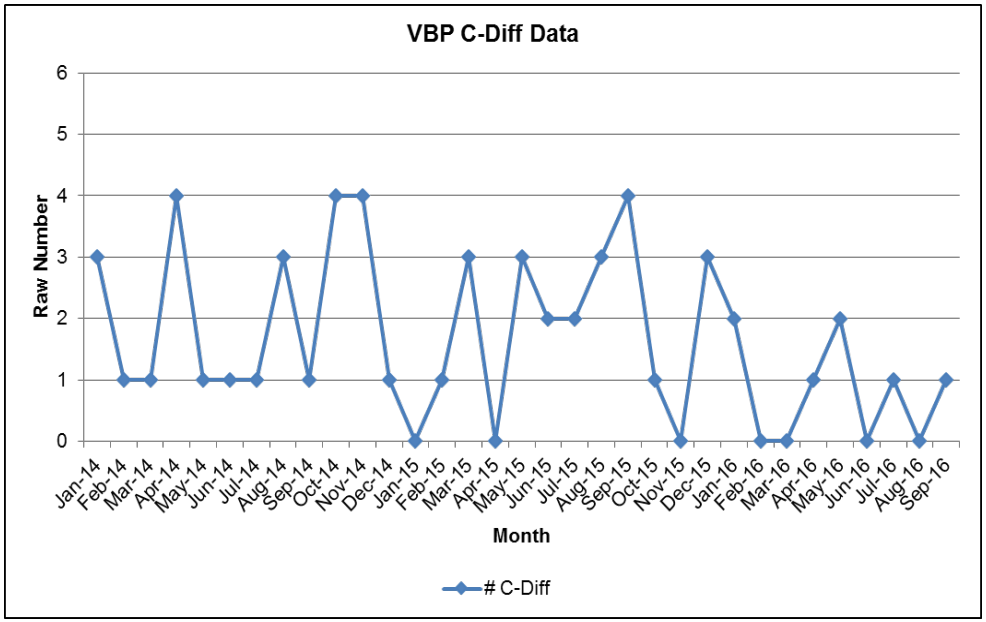
C-Diff Data





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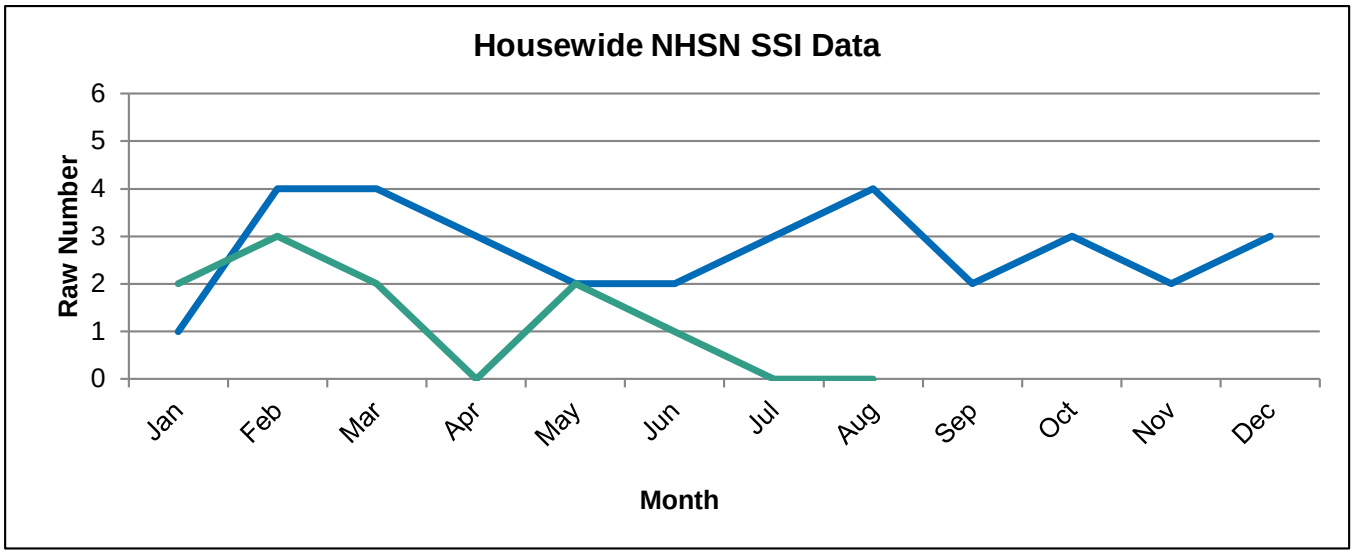
AMS Examples from St. Charles

- Surgical prophylaxis
  - Pre-op antibiotic order set updated.
  - Pre-op antibiotics entered ahead of procedure with review and automatic dose adjustment by a pharmacist the day before surgery.
  - Removal of ertapenem from order set
  - Morning surgery huddles



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AMS Examples from St. Charles

- Focus on Sepsis
  - Appropriate antibiotics
  - Appropriate administration of antibiotics
  - Appropriate labs
- Focus on Cellulitis
  - Appropriate antibiotics
  - Early surgery consults
  - Consideration of outpatient therapy

AMS Examples from St. Charles

- Other areas of focus
  - Order sets
  - Auto stop of antibiotics
  - COPD
  - UTI
  - Blood culture contamination rate
  - Fluoroquinolone use
    - FDA warning

FDA Drug Safety Communication: FDA advises restricting fluoroquinolone antibiotic use for certain uncomplicated infections; warns about disabling side effects that can occur together

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[05-12-2016]

Safety Announcement

The U.S. Food and Drug Administration is advising that the serious side effects associated with fluoroquinolone antibacterial drugs generally outweigh the benefits for patients with acute sinusitis, acute bronchitis, and uncomplicated urinary tract infections who have other treatment options. For patients with these conditions, fluoroquinolones should be reserved for those who do not have alternative treatment options.

An FDA safety review has shown that fluoroquinolones when used systemically (i.e. tablets, capsules, and

Self-Assessment Question #1

(True/False). Consensus guidelines state that physician leadership, administrative support and education for health care professionals are all key elements to a successful antimicrobial stewardship program.

A. True
B. False

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Self-Assessment Question #2

- (T/F) Education and policy development as well as direct patient interventions are both effective approaches to antimicrobial stewardship.

A. True

B. False

Self-Assessment Question #3

- T/F. Strategies to report antimicrobial stewardship program interventions are well defined in the literature.

A. True

B. False

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Key Takeaways

- Key Takeaway #1
  - Getting started on a stewardship program is possible even with a limited staff.
- Key Takeaway #2
  - Small continual changes, regardless of initial approach, will have a positive impact.
- Key Takeaway #3
  - Reporting metrics are a challenge, but focusing on appropriate use will show positive changes.

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(Management Case Study)
Antimicrobial Stewardship: Small Hospital Strategies

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Thank you !

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